

FINAL REPORT

**FINAL**

**EVALUATION**



Central Sulawesi The Rehabilitation  
and Reconstruction Project  
(CSRRP)



T.A 2024



PT. Ciriayasa Engineering Consultant *Joint Venture*  
with PT. Prismaita Cipta Kreasi

## FOREWORD



The series of earthquakes, tsunamis, and liquefaction disasters that occurred in Central Sulawesi on September 28, 2018, have impacted community activities with damaged housing and infrastructure supporting social and economic activities. Data collection conducted by the National Disaster Management Agency (NDMA) showed that the total damage reached more than 18 trillion Rupiah. The settlement sector and basic infrastructure including roads and bridges, irrigation systems, drinking water, wastewater, electricity and communication networks, and public facilities were the most affected.

Rebuilding better, safer, and more sustainable is the vision of restoring life in affected districts. The Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) is present to support this vision through (i) provision of permanent housing units and settlement infrastructure; (ii) rehabilitation and reconstruction of public facilities; and (iii) activity implementation support. In its implementation, CSRRP prioritizes the principles of earthquake-resistant buildings, universal design, risk mitigation for Gender-Based Violence, waste and debris management, and the application of green buildings. CSRRP as part of the Indonesia *Disaster Resilience and Reconstruction* (IDRAR) program also targets improving the preparedness and resilience of disaster-affected, high-risk, and center of economic development areas.

This Final Evaluation CSRRP Report is one of six reports on evaluation activities and studies conducted by the ESC CSRRP in 2024. Based on the evaluation results presented in this report, it appears that the implementation of CSRRP has been able to achieve the targets until October 2024 and even some key performance indicators have been exceeded. This achievement is certainly encouraging for us as program implementers. It is hoped that the results of this Final Evaluation can provide lessons learned and input for the development of appropriate implementation strategies in our efforts to achieve better program outcomes than the planned targets.

Jakarta, Oktober 2024

Head of Central Project Management Unit  
CPMU - CSRRP

  
**Arie Setiadi Moerwanto**

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## LIST OF ABBREVIATIONS

APBD	: <i>Anggaran Pendapatan dan Belanja Daerah</i>
APBN	: <i>Anggaran Pendapatan dan Belanja Nasional</i>
BAPPPEDA	: <i>Badan Perencanaan Pembangunan Daerah</i>
BAPPENAS	: <i>Badan Perencanaan Pembangunan Nasional</i>
BP2JK	: <i>Balai Pelaksana Pengadaan Jasa Konstruksi</i>
BP2P	: <i>Balai Pelaksana Penyediaan Perumahan</i>
BNPB	: <i>Badan Nasional Penanggulangan Bencana</i>
BPBD	: <i>Badan Penanggulangan Bencana Daerah</i>
BPPW	: <i>Balai Prasarana Permukiman Wilayah</i>
CPMU	: Central Project Management Unit
CSRRP	: Central Sulawesi Rehabilitation and Reconstruction Project
DAP	: Disaster Affected People
DED	: Detailed Engineering Design
DJCK	: <i>Direktorat Jenderal Cipta Karya</i>
DPKP	: <i>Dinas Perumahan dan Kawasan Permukiman</i>
DPRP	: <i>Dinas Penataan Ruang dan Pertanahan</i>
DPU	: <i>Dinas Pekerjaan Umum</i>
DPZ	: Disaster Prone Zone
DRM/PRB	: Disaster-Risk Management / <i>Penanganan Risiko Bencana</i>
ESC	: Evaluation and Study Consultant
HAT	: <i>Hak Atas Tanah</i>
Huntap	: <i>Hunian Tetap</i>
Huntara	: <i>Hunian Sementara</i>
KPI	: Key Performance Indicators
LAP	: Land Acquisition Plan
LARAP	: Land Acquisition and Relocation Action Plan
LC	: Land Consolidation
LCP	: Land Consolidation Participant
LG	: Local Government
MAASP/NLA	: The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency
NDMA	: National Disaster Management Agency
NMC	: National Management Consultant
OPD	: <i>Organisasi Perangkat Daerah</i>
OSP	: <i>Oversight Service Provider</i>
PAD	: Project Appraisal Document
PAP	: Project Affected People
PDO	: Projects Development Objective
PIU	: Project Implementation Unit

PJU	: <i>Penerangan Jalan Umum</i>
PKP	: <i>Perumahan dan Kawasan Permukiman</i>
PMC	: <i>Project Management Consultant</i>
PMU	: <i>Project Management Unit</i>
POKJA	: <i>Kelompok Kerja</i>
POM	: <i>Project Operational Manual</i>
PPK	: <i>Pejabat Pembuat Komitmen</i>
PWoH	: <i>Public Works and Housing</i>
RAB	: <i>Rencana Anggaran Biaya</i>
RAP	: <i>Rencana Aksi Pemindahan / Relocation Action Plan</i>
RPJMD	: <i>Rencana Pembangunan Jangka Menengah Daerah</i>
RPJMN	: <i>Rencana Pembangunan Jangka Menengah Nasional</i>
RPP	: <i>Rencana Penataan Permukiman</i>
RT	: <i>Rukun Tetangga</i>
RTH	: <i>Ruang Terbuka Hijau</i>
RTP	: <i>Ruang Terbuka Publik</i>
RTRW	: <i>Rencana Tata Ruang dan Wilayah</i>
RW	: <i>Rukun Warga</i>
SETDA	: <i>Sekretariat Daerah</i>
SHM	: <i>Sertifikat Hak Milik</i>
SITABA	: <i>Sistem Informasi Tanggap Bencana</i>
SK	: <i>Surat Ketetapan/Keputusan</i>
SKPT	: <i>Surat Keterangan Penguasaan/Pemilikan Tanah</i>
STB-HAT	: <i>Surat Tanda Bukti Hak Atas Tanah</i>
TFL	: <i>Tim Fasilitator Lapangan</i>
TMC	: <i>Technical Management Consultant</i>
WB	: <i>World Bank</i>

# EXECUTIVE SUMMARY

## 1. Background

On September 28, 2018, Central Sulawesi Province in Indonesia was hit by devastating natural disasters, including earthquakes, tsunamis, and liquefaction. These events not only claimed thousands of lives but also resulted in massive damage to infrastructure and settlements. The impacts caused by these disasters were significant, encompassing widespread damage to public and social facilities and causing severe disruptions to people's social and economic activities. In response to this emergency situation, the Government of Indonesia, with support from various international organizations, launched the Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) to restore and strengthen infrastructure and provide safer and more sustainable shelter for affected communities.

## 2. Project Aims and Objectives

The CSRRP project addresses the urgent need to rehabilitate and reconstruct destroyed infrastructure and rebuild community life more resiliently and securely. The project is divided into three main components:

1. **Provision of permanent housing and settlement infrastructure:** The main focus is rebuilding earthquake-resistant shelters and settlement infrastructure that meet higher safety standards to reduce the risk of future disasters.
2. **Rehabilitation and Reconstruction of Public Facilities:** Including schools, health centers, and other public infrastructure vital to communities' social and economic recovery.
3. **Activity Implementation Support:** Coordinate and monitor project implementation to ensure all activities go according to plan and achieve expected targets.

## 3. Evaluation Methodology

The final evaluation of CSRRP involved data collection through surveys, interviews, and field observations to measure the achievement of project targets. *Stratified random sampling* resulted in a sample of 578 respondents with a *margin of error of 3.7%*. This approach was complemented by in-depth quantitative and qualitative analysis to assess the effectiveness of the interventions undertaken as well as the identification of lessons learned for future learning.

## 4. Evaluation Results

### 4.1 Respondent Profile

This section presents the demographic profile of the respondents involved in the final CSRRP evaluation. This data is essential to understand who benefited from the project and in what context the CSRRP interventions were carried out.

- **Demographics:** Most respondents were homeowners whose homes were affected by the disaster. Most respondents were male, and many women also provided feedback on services received. 70% of respondents were male and 30% were female
- **Age and Occupation:** Respondents covered various age groups and occupational backgrounds, which helped gauge the project's effects on diverse demographics. The age range was 18-65 years, with 40% working in the agricultural sector and the other 60% spread across different sectors.
- **Occupant Status:** Shows that 71.8% of residents are owners according to the Decree (SK) of occupancy, while 28.2% are family members outside the Decree of Occupancy. No tenants or contract occupants are reported in this sample.
- **Length of Residence:** Indicates that most residents (68.5%) have lived in their premises for 4-7 months, followed by 19.4% who have lived 0-3 months. Residents who stayed for more than 8 months in a row decreased with a longer duration.
- **Waiting Time Against Waiting Reasons:** Waiting reasons to occupy based on the duration of time. Most residents who wait from 0 to 3 months do so because they are waiting for a good day or waiting for the completeness of basic facilities. For a period of 7-9 months, the reason for waiting has more to do with waiting for the completeness of social and public facilities, reflecting the priority for more complete infrastructure before occupancy.
- **Waiting Time for Residents' Income:** Describes the relationship between residents' income and the length of time they wait to occupy a residence. Residents with lower incomes (< Rp. 2,000,000) tend to delay placement longer compared to those with higher incomes (> Rp. 2,000,000 to Rp. 3,000,000), who are more likely to occupy their residence sooner.

## 4.2 Benefits

In an effort to improve the quality of life and safety of residents, permanent housing development has provided various significant benefits in the housing sector. Most residents (93%) are aware that the homes they occupy are designed to be earthquake-resistant, providing a high sense of security with 90% feeling confident in the safety offered. Protection against severe weather was also a priority with 99.2% of homes being built to protect residents from extreme weather conditions, while the general comfort of homes was praised by 91.2% of respondents.

In addition, public facilities built in a fixed residential environment also show a great contribution. Sanitation facilities, including toilets and grey water, were appreciated for improving household and environmental hygiene with more than 85% satisfaction. Green and public open spaces are appreciated by 97.1% of residents because they provide communal spaces that enrich social interaction and environmental aesthetics, as well as save costs in the management of community social events.

Supporting infrastructure such as the integrated domestic wastewater management system (SPAL DT) received full recognition from all respondents (100%) for its effectiveness in keeping the environment healthy and clean. Efficient drainage was praised by 98.77% of

residents for successfully reducing the potential for inundation and flooding. Public street lighting, which was well received by 97.6% of respondents, not only improved safety but also environmental aesthetics. The roads built facilitate access to essential facilities such as workplaces (71.3%), markets (60.1%), and healthcare facilities (50%), with this increase in accessibility marking a substantial improvement in the quality of daily life.

This development emphasizes the importance of resilient and integrated infrastructure in supporting residents' daily lives in a sustainable and safe way, reflecting a commitment to development that is not only durable but also inclusive and sustainable.

#### 4.3 Project Efficiency and Economic Analysis

In general, the project has achieved a fairly good level of efficiency, although there is significant variation among the different types of infrastructure and units built. This efficiency is important for evaluating the use of funds and the returns obtained from those investments.

- **Overall Project Investment Efficiency:**

- Project Efficiency Analysis (US\$150 million), conducted against actual cost US\$ 135,837,791.24 (91%) from allocated costs), projected 17 Years, Discount Rate 10%:
  - Component-1 Investment: US\$ 83,405,080.42
  - Component-2 Investment: US\$ 37,137,986.95
  - Component 3: US\$ 15,294,723.86
  - Total Investment + OM: US\$ 2,240,760,997
  - Total Benefit: US\$ 6,848,283,525
  - Total Net Benefit: US\$ 4,607,522,528
  - Leverage capacity of project assistance funds of 11% \*)
- Overall evaluation of the investments that have been made in various project components. For a period of 17 years with a discount rate of 10%, the NPV (Net Present Value) for component 1 reached US\$ 100,679,022 with an EIRR of **19%**, while **component 2 NPV reached US\$ 56,183,306 with an EIRR value of 34%** while for **the entire project the total NPV reached US\$ 747,017,330** and the internal rate of return (EIRR) was 28%. So that the project can be said to be efficient and provide great benefits. Investments for specific components such as housing and infrastructure, health facilities, education, and other public facilities are also assessed, with a percentage that shows how much of the total funds are used for each component.
- **Efficiency Based on Type of Infrastructure:** Cost Efficiency is the difference in construction costs based on the calculation of Engineering Estimate (EE) with Construction Costs according to the contract, which can be classified based on:
  - **Efficiency of shelter and settlement infrastructure** ; For housing units only, efficiency reaches 24%, houses with PSU pers 21%, houses + PSU pers + other infrastructure 22%, and for residential infrastructure the efficiency is 22%
  - **Efficiency for public facilities;** overall reached 24%, assessment of Tadulako University 21%, State High Prosecutor's Office 34%, Undata Hospital 14%, and Fasdiksar 10%



#### 4.4 Achievement of End-of-Program Targets

This subchapter describes the extent to which CSRRP achieved the end goals set at the start of the project.

- From the achievement of the target until October 31, 2024, the final target has not been fully achieved, of the 21 indicators, 10 (47%) have been achieved, namely in 1 PDO indicator and 9 Intermediate Result indicators, while 2 PDO indicators and 9 Intermediate result indicators have not been achieved, the KPI has not been achieved because there are several activities that have not been completed, including the Poboya IPA, the Palu and Sigi pipeline networks and several public facility buildings (BNN & the Sigi Regent office) and have not been fully functional SITABA. Overall, PDO is projected to be achieved in early December 2024, along with the completion of all physical works and activities.
- Key Factors for Achieving Targets include:
  - For PDO 1 and Component 1:
    - Presidential Instruction Number 10 of 2018 and Number 8 of 2022, especially related to data collection
    - Governor's Decree on Welfare and also Regent/Mayor Decree on WTB and occupancy
    - The readiness of the Housing PMU and PMU Cipta Karya which is supported by BPPW, BP2P and also all related Satker and PPK
    - Capacity and Readiness of the Regional Government in determining the WTB Decree and the Occupancy Decree and also in the issuance of PBG and SLF
    - Land acquisition
    - Assistance from TMC 2, TMC 1, OSP coordinated by PMC
    - Capacity and speed of the Contractor in building facilities and infrastructure
  - For PDO 2 and Component 2:
    - The readiness of PMU Cipta Karya is supported by BPPW and related Satker and PPK
    - Readiness and support of the Administrator/final recipient from Planning, Implementation and Maintenance
    - TMC Assistance 1 is coordinated by PMC
  - For PDO 3, the key factors are:
    - WTB who need a house immediately
    - Readiness of shelters equipped with basic facilities and infrastructure
    - Assistance from TMC 2, TMC 1, OSP coordinated by PMC
  - For Component 3:
    - PMU Cipta Karya Support
    - Software and Hardware Readiness for SITABA
    - Readiness, capacity, and speed of PMC in managing MIS and SITABA Websiste, in managing the complaint system, in compiling and socializing guidelines for inclusive and resilient building standards
- In terms of Construction Effectiveness and Quality:
  - ESC conducted its own assessment with different methods and parameters, the assessment was carried out only on a sample of 226 shelters with complete and occupied

facility status, while KPI calculations were carried out on 3880 shelters whether they were complete and occupied.

- Based on the results of the Observation of the Quality and Functionality of Infrastructure on a sample of 226 Huntaps that have been completed and declared complete, that overall the Quality of Huntap Infrastructure is 95% considered good, 89% of Huntap is also considered to have functioned well. So it can be assumed that if the physical work of all shelters has been completed, completed and occupied, has the potential for KPIs to be achieved
- Based on the results of the quality observation of public facilities in 9 public facilities, 97.95% are considered to be of high quality, 93.76% are considered to be functional.

#### 4.5 Effectiveness of Institutional Arrangements for Achieving End Targets

Evaluation of institutional effectiveness in supporting the achievement of program targets. **In general, Institutional Structuring in achieving CSRRP targets:**

- Not Effective for the achievement of KPI targets, especially PDO 1 and 2, KPIs 1.1, 1.1.1, 1.3, 1.4, 1.8, 2.1, 2.2, 2.3, 2.4 and 3.1
- Effective in terms of WTB Identification, Land Acquisition, Social and Environmental Safeguards, PBG & SLF, Complaint Handling and Asset Management, Institutional Arrangement in general is shown by:
  - The existence of institutions such as guidelines/regulations such as Presidential Instruction 10 years 2018, and no 8 of 2022, as well as implementation guidelines and technical instructions such as POM, ESMF, etc.
  - The existence of an organizational structure and the division of tasks and functions between fields both in SEP and in POM as well as good implementation.

#### 4.6 Key Factors for Collaboration and Sustainability

On factors that support effective collaboration among stakeholders and ensure sustainability of project outcomes.

a. **Institutions:**

- a. Presidential Instruction related to Presidential Instruction Number 10 of 2018 and Number 8 of 2022.
  - b. Decree of the Governor of Central Sulawesi Number: 360/034/BPBD/- G.ST/2019 concerning the Determination of Criteria for the Rights of Victims of Earthquake, Stunami and Liquefaction Disasters in Central Sulawesi Province in 2018.
  - c. The development of guidelines/rules related to the implementation of CSRRP such as POM, ESMF, POS, Modules for each stage of work implementation helps ensure smooth and compliance with operational standards, which is very important to support the success and sustainability of the program.
2. **Organizational Structure;** The existence of a CSRRP organizational structure that is under one CPMU command, combining 2 directors general of Housing and Cipta Karya of the Ministry of PUPR along with the division of their roles as stated in the SEP and POM.
  3. **Like-minded understanding and need** among stakeholders in Disaster Management.

4. **Mechanism of Regular Communication and Coordination** between stakeholders by CPMU and PMU.
5. **Formal and interpersonal assistance from the Ministry of PUPR to Regional Governments** through PMC, TMC, and OSP Assistance Consultants.
6. **Readiness and capacity of the Regional Government** in providing support for the implementation of CSRRP and in managing assets.
7. **Community Involvement and Capacity in activities and also management of infrastructure assets.**

#### 4.7 Compliance and Appropriateness of Program Implementation Principles

Analyze the level of compliance with the principles established for project implementation and the extent to which these principles have been followed during implementation.

Based on the results of this evaluation, the CSRRP Project has complied with the Environmental and Social Commitment Plan (ESCP) as per the Loan Agreement, integrated GBV and VAW mitigation in the environmental and social management documents (ESMP and CSEMP), and implemented construction strategies to reduce gender-based violence. Universal design has been implemented in public infrastructure to improve accessibility for disabilities, and green building is reinforced by the use of non-hazardous materials and the application of technologies such as solar panels. Earthquake-resistant building structures using reinforced concrete and steel frames are applied to various public buildings and infrastructure types. In addition, water-sensitive urban design is implemented through the use of permeable pavement materials and stormwater management infrastructure to control flooding.

## 5. Conclusions and Recommendations

### 5.1 Conclusion

1. The CSRRP project is generally efficient and effective, but there are shortcomings in the achievement of KPI because some activities have not been completed, so the final performance of the project cannot be shown.
2. WTB's profile is dominated by women (57%), the highest education of 48.5% is high school, the average income < from Rp 2,000,000,-
3. In general, this project provides significant benefits for beneficiaries of shelters, settlement infrastructure, and public facilities. These benefits are reflected in the increase in public accessibility to safe shelter services and public facilities. Almost 100% of respondents stated that earthquake-resistant buildings in the shelter provide a sense of security and comfort, and are equipped with basic and inclusive facilities.
4. Overall, CSRRP investments have proven to be efficient, feasible, and beneficial. The project efficiency analysis, which involved an actual cost of **US\$ 135,837,791.24** (91% of the allocated budget), showed positive results with a projection of 17 years and a discount rate of 10%. The details of the investment include **Component-1** of **US\$ 83,405,080.42**, **Component-2** of **US\$ 37,137,986.95**, and **Component-3** of **US\$ 15,294,723.86**, with a total investment and OM of **US\$ 2,240,760,997**. This program

resulted in a total benefit of **US\$ 6,848,283,525**, and a net benefit of **US\$ 4,607,522,528**. In addition, the leverage capacity of the project assistance fund reached **11%**, signaling the positive impact and significant financial sustainability of this investment.

5. Project NPV US\$ 747,017,330 with EIRR 28%, NPV component 1 US\$ 100,679,022 with EIRR 19%, NPV Component 2 US\$ 656,183,306 with EIRR 34%, For Housing and Residential Infrastructure the NPV is US\$ 92,321,058 with EIRR 18%, for Health Facilities the NPV is US\$ 322,056,632 and EIRR 67% while the NPV education facilities are US\$ 305,577,258 with EIRR 32%.
6. The efficiency of the unity of infrastructure types is measured based on the difference in construction costs between the calculation of the Engineering Estimate (EE) and the construction cost according to the contract. For house units, efficiency reaches **24%**, while for houses with PSU persil the efficiency is **21%**, and houses + PSU pers + other infrastructure reach **22%**. As for the infrastructure of shelter settlements, the efficiency is **22%**. The efficiency for public facilities as a whole reached **24%**, with details: Tadulako University **21%**, State High Prosecutor's Office **34%**, Undata **Hospital 14%**, and Fasdiksar **10%**.
7. Until October 31, 2024, the final target of the program has not been fully achieved. Of the 21 indicators set, **10 indicators (47%)** have been achieved, consisting of **1 PDO indicator** and **9 Intermediate Result indicators**. Meanwhile, **2 PDO indicators** and **9 Intermediate Result indicators** have still not been achieved. Overall, PDO achievements are projected to be realized in early December 2024, along with the completion of all physical work. The delay in achieving KPI is caused by several unfinished activities, including the Poboya IPA, the pipeline network in Palu and Sigi, as well as several public facility buildings such as BNN and the Sigi Regent office, as well as the full functioning of SITABA.
8. The key factors in achieving the program's targets involve several important elements. First, **Presidential Instruction Number 10 of 2018 and Number 8 of 2022**, especially related to data collection, provides a strong basis for smooth implementation. In addition, **the Governor's Decree** on the Governor's Decree and **the Regent/Mayor's Decree** on WTB and occupancy are legal references in this program. The readiness of **PMU Housing and PMU Cipta Karya**, which is supported by BPPW, BP2P, as well as all related Satkers and PPKs, also plays a big role in the implementation of the program. Then, **the readiness of the Regional Government** in determining the WTB Decree and the Occupancy Decree as well as the issuance of PBG and SLF greatly supports the smooth administration. **Land acquisition** is an important step in the development of facilities and infrastructure, while **assistance from TMC 2 and TMC 1**, coordinated by PMC, ensures that the process runs as planned. Finally, **the capacity and speed of contractors** in building facilities and infrastructure support the achievement of targets within the specified time. All of these factors are intertwined to ensure the overall success of the program.

9. ESC conducted its own assessment using different methods and parameters, focusing on a sample of **226 shelters** that have completed facilities and have been occupied. Meanwhile, KPI calculations were carried out on **3,880 shelters**, both complete and inhabited and uninhabited. Based on the results of observations on the quality and functionality of infrastructure in a sample of **226 shelters** that have been declared complete, **95%** of the infrastructure is considered good, and **89% of** shelters are also considered to be functioning properly. From these findings, it can be assumed that if all physical work on all shelters is completed, complete, and occupied, then the program's KPIs have the potential to be achieved.
10. Based on observations on **9 public facilities**, **97.95%** were considered quality and **93.76%** functioned well. ESC assesses the effectiveness of facilities using KPI indicators with different methods, and all facilities observed (**100%**) meet KPI parameters.
11. Key factors in achieving the target of construction effectiveness and quality include planning that involves coordination between stakeholders, starting from land provision, design, to changes that occur, even though there are problems such as the utility infrastructure that has not been completed even though the occupancy has been carried out. In implementation, the availability of skilled labor on time, a safe working environment, and unstable land management, such as what happened in Huntap Tondo due to land shifting, are important factors. In addition, good material quality and material testing as well as effective construction control and monitoring are also very influential. For maintenance, the process of handing over public infrastructure is constrained, while the maintenance of residential infrastructure is hampered by the legality of O&P and limited financing.
12. In general, institutional structuring in achieving CSRRP targets has not been fully effective, especially for the achievement of KPI targets such as PDO 1 and 2, as well as KPIs 1.1, 1.3, 1.4, 1.8, 2.1, 2.2, 2.3, 2.4, and 3.1. However, institutional structuring has proven to be effective in several aspects, such as WTB identification, land acquisition, social and environmental safeguards, PBG & SLF, complaint handling, and asset management. This effectiveness is reflected in the existence of clear institutional institutions, such as guidelines and regulations (Presidential Instruction 10/2018 and 8/2022), as well as POM, ESMF, and others. In addition, there is a clear organizational structure with a division of duties and functions between fields, both in SEP and POM, as well as good implementation in its operations.
13. Key factors for the collaboration and sustainability of the CSRRP program include several important elements, namely the existence of **Presidential Instructions** (Number 10/2018 and 8/2021) as well as the development of implementation guidelines and rules such as POM, ESMF, POS, and implementation stage modules that ensure smooth and compliance with operational standards. The program also has **a coordinated organizational structure** within one CPMU command, combining two Directors General (Housing and Cipta Karya) from the Ministry of PUPR with a clear division of roles in SEP and POM. In addition, there is a **common need between**

**stakeholders** in providing land for disaster management, as well as a **regular communication and coordination mechanism** carried out by CPMU and PMU. **Assistance from the Ministry of PUPR**, both formally and interpersonally through PMC, TMC, and OSP Assistance Consultants, also plays an important role. Finally, the **readiness and capacity of the Regional Government** in supporting the implementation of CSRRP and managing assets is a crucial factor in ensuring the sustainability of this program.

14. In terms of compliance with social and environmental safeguards management and the implementation of the five principles of project implementation, CSRRP has complied with the Environmental and Social Commitment Plan (ESCP) contained in the Loan Agreement for Loan 8979-ID. Mitigation of Gender-Based Violence (KBG) and Violence Against Children (KTA) has been implemented at the sub-project level, with mitigation plans integrated in environmental and social management documents (ESMP and CSEMP). The implementation of SEA/GBV management is also carried out in infrastructure design planning, including the involvement of women in safe planning and design. Universal design has been implemented in many types of infrastructure, especially public facilities, by providing access for people with disabilities, such as disability-only toilets, access ramps, and sidewalks with guiding blocks. In addition, environmentally friendly buildings are implemented by using hazard-free materials (such as asbestos or lead paint), as well as the application of PJU solar panels and residential wastewater management systems. Earthquake-resistant buildings are a major aspect of the design of construction structures, with the use of reinforced concrete and steel frames. The application of water-sensitive urban design is also applied to several constructions, such as the use of permeable pavement materials, the construction of infiltration wells, and retention ponds to control rainwater runoff and floods.

## 5.2. Recommendation:

### 1. Program Benefits Aspects;

- a. In order to get better satisfaction for beneficiaries and public facilities, in the future it is necessary to improve the quality of services during construction and post-occupancy as well as the quality of infrastructure built by conducting two-way and intense communication with beneficiaries, as well as more intensive project control in terms of time and quality.
- b. To maintain satisfaction and at the same time increase the benefits of the Program, what must be done is to maintain the infrastructure that has been built by immediately handing over both to the community and to the Regional Government and other final recipients, so that it can be immediately utilized and maintained as well as possible.

2. **Program Efficiency Aspects;** Based on the results of economic analysis, this program was declared efficient and useful. The value of efficiency and the value of benefits that have been achieved are carried out with certain assumptions. In the future, the value of the efficiency of rehabilitation and reconstruction programs can be further developed, especially in terms of calculating the direct benefit value of earthquake-resistant buildings.



3. **Program Effectiveness Aspect:** Accelerating the completion of delayed activities to meet all KPI targets in accordance with Presidential Instruction No. 8 of 2022, through more intensive coordination and communication between all relevant parties.
4. **Aspects of the effectiveness of institutional structuring;** The implementation of the Rehabilitation and Reconstruction program does involve multi-actors and multi-stakeholders, on the one hand this is part of collaboration, but on the other hand it can hinder the effectiveness in terms of time in the implementation of activities. This is shown by the slow achievement of program KPIs. Therefore, it is necessary to prepare an institution that is much more effective and efficient and also improve coordination and communication in rehabilitation and reconstruction.
5. **Aspects of Institutional Collaboration and Sustainability Assurance;**
  - a. Institutional collaboration can only occur if each party fully understands the division of duties, therefore documents such as the SEP (Stakeholder Engagement Plan) and also the POM become documents that effectively bind actors to carry out their responsibilities
  - b. **Sustainability of Asset Management:** The readiness to receive assets by the Palu City Government and Sigi Regency is considered not fully ready. Adjustment of regulations regarding capital participation for the management of SPAM by Perumdam Avo Palu City as well as regulations on the management and determination of waste service tariffs for TPS3R Sigi. Meanwhile, the Donggala Regency Government has been considered more ready to receive assets, especially for the infrastructure of the Huntap Tompe settlement. However, the Tompe Village KPP is not fully ready to manage assets, considering the unavailability of budget for operation and maintenance and the lack of strengthening the capacity of human resources for community-level managers. (readjusted to No. 4 above).
6. **Compliance Aspects of Social and Environmental Security Management;**
  - a. **Social and Environmental Security:** Improve the implementation of social and environmental security to not only meet administrative requirements but also ensure the safety and sustainability of the project for all parties.
  - b. **Application of 5 principles of activity implementation;** It is very good to apply in relation to the inclusivity of the infrastructure built and also ensure sustainability in environmental aspects. For future programs, it can be applied by setting it as a separate project document.
7. **Development Model:** Adopt a CSRRP approach that focuses on resilience, resilience, and inclusivity as a model for similar projects in the future, with improvements to institutional structuring for better effectiveness.



## CHAPTER 1 INTRODUCTION

### 1.1. Background

A 7.4 magnitude earthquake with a depth of 10 km north of Palu City, Central Sulawesi Province, followed by a tsunami and liquefaction at several points on September 28, 2018, displaced more than 50,000 people. The disaster caused damage to key infrastructure and thousands of public and social facilities in Palu City and surrounding districts.

Damage to residential (houses) and social sectors such as education, health, and public service office buildings resulted in decreased community productivity in the affected locations. For this reason, rebuilding is a priority for the Government and affected communities.

Based on Presidential Instruction No. 10/2018 on the Acceleration of Rehabilitation and Reconstruction after the Earthquake and Tsunami Disaster in Central Sulawesi Province and Other Affected Areas, the Ministry of Public Works and Public Housing is responsible for, among others, carrying out rehabilitation and reconstruction of education, health, economic support, and basic infrastructure facilities; supervising the implementation of rehabilitation and reconstruction of the facilities above; and assisting and supervising the construction of earthquake-resistant housing carried out under self-help schemes by the community and contractually.

The Government of Indonesia is committed to implementing the Central Sulawesi Rehabilitation and Reconstruction Program (CSRRP) to deliver recovery programs in Central Sulawesi and help rehabilitate, reconstruct, and reduce potential human and economic losses during future earthquakes and other disaster events by improving the quality of public facilities and residential settlements in Palu, Donggala, and Sigi.

The proposed development objective is to reconstruct and strengthen public facilities and safer housing in certain disaster-affected areas.

The project consists of three components and is financed as follows:

**Table 1. Project Components and Financing**

No.	Component	Cost (US\$, Million)
1	Construction of permanent housing units and safe settlement infrastructure	91,30
2	Rehabilitation and Reconstruction of safe public facilities	31,80
3	Activity implementation support	26,90

Source: *Project Appraisal Document*, World Bank, 2019

CSRRP is currently running in its third year and the closing date is December 2024. The Executing Agencies at the central level as the Project Management Unit (PMU) are the Directorate General of Human Settlements (DGHS) and the Directorate General of Housing

(DGHS) under the Ministry of Public Works and Housing (MPWH). At the provincial level, there are BPPW and BP2P as Project Implementation Units (PIUs). DGHP will build around 3,600 permanent housing units in new locations, facilitate community planning, and supervise construction work. DGHS will provide construction of settlement infrastructure and reconstruction of public facilities and is responsible for coordinating the results achieved by each PIU and measuring progress towards the project objectives. Disbursements are expected to be made as follows: (US\$ Million)

**Table 2. Project Disbursement Plan**

Fiscal	Year						
	2019	2020	2021	2022	2023	2024	2025
Annual	0,00	15,00	43,00	40,00	40,00	12,00	0,00
Cumulative	0,00	15,00	58,00	98,00	138,00	150,00	150,00

Source: *Project Appraisal Document, World Bank, 2019*

The project will conduct evaluations to determine program achievements, and to provide feedback to improve current and future designs and programs where possible. The consultant will assess and measure project implementation using the project document and guidelines.

## 1.2. Purpose and Objectives of Evaluation

The final evaluation aims to determine program achievements, project efficiency and effectiveness and factors affecting project achievements, lessons learned in technical, fiduciary and environmental and social aspects. In addition, it assesses compliance with environmental and social risk management and 5 principles in project implementation (SEA/GBV (Mitigation of gender-based violence), universal design, earthquake-resistant buildings, sustainable buildings and water-sensitive urban design and provides feedback on improving program planning and implementation and assessing and measuring project implementation by project documents and project guidelines.

The general objective of this final evaluation is to assess project performance, project efficiency and effectiveness and factors affecting project achievements, lessons learned on technical, fiduciary and environmental and social aspects. It also assessed compliance with environmental and social risk management and the 5 principles in project implementation (universal design, earthquake resistant building, sustainable building and water sensitive urban design).

The specific objectives of this evaluation were:

1. Assessing the benefits of shelter construction and resilient settlement infrastructure;
2. Assess the benefits of resilient reconstruction and strengthening of public facilities;
3. Measures the extent to which the project reflects the overall efficiency of the investment;
4. Measure the achievement of the final target (construction effectiveness and quality) and the factors affecting the achievement of the target;
5. Measuring how effective the institutional arrangements are in achieving the expected targets;

6. Identify what are the key factors that enable institutional collaboration and ensure sustainability;
7. Assessing compliance assessing compliance assessing environmental and social risk management and the 5 principles in project implementation (SEA/GBV (gender-based violence mitigation), universal design, earthquake-resistant building, *sustainable building* and water-sensitive urban design).

### 1.3. Evaluation Question

These objectives will be explored through several key questions:

#### A. Quantitative Survey:

1. What are the benefit of resilient construction of permanent housing units and settlement infrastructure? The analysis should be on targeted people having safer housing completed and occupied and targeted people satisfied with completed housing (disaggregated by gender).
2. What are the benefit of resilient reconstruction and strengthening of public facilities?

#### B. Project efficiency and effectiveness:

3. To what extent the project has reflected efficiency of the overall investments? (Efficiency in the unit cost of housing and infrastructure, public facilities built, capacity to leverage funding to achieve the estimated project cost)
4. Has the program achieved the final target (effectiveness and the quality of construction)? What factors influence the achievement of the targets?

#### C. Qualitative:

5. How effective the institutional arrangement works to achieve the expected targets?
6. What are key factors that have enabled institutional collaboration and ensuring sustainability?
7. Has the project implemented of the social and environmental safeguard in the project, including 5 principles in the program implementation, they are SEA/GBV, Universal Design, Seismic Resilience, Sustainable Building, and Water Sensitive Urban Design.

### 1.4. Report Systematics

## CHAPTER 1 INTRODUCTION

This chapter provides the background to the implementation of CSRRP, including the disaster context that led to the need for the project, as well as its vision and mission. It also explains the purpose of the evaluation, the key evaluation questions, and the significance of the evaluation to continuous improvement in disaster management and infrastructure rehabilitation.

## **CHAPTER 2 LITERATURE REVIEW**

Reviews the theoretical framework and previous research relevant to post-disaster rehabilitation and reconstruction. This chapter provides the scientific basis and context for the project, including a discussion of resilient development models and disaster mitigation strategies that have been applied elsewhere.

## **CHAPTER 3 METHODOLOGY**

Details of the methodology applied in the CSRRP evaluation, including the study design, data collection approach, analysis techniques, and mechanisms for validating the results. This chapter is essential for understanding how data was collected, processed, and analyzed to produce credible conclusions.

## **CHAPTER 4 CSRRP *FINAL EVALUATION* RESULTS**

This section presents the results of the CSRRP *Final Evaluation* on the topics of Respondent Profile, Beneficiary Satisfaction, Benefits, Project Efficiency and Economic Analysis, Achievement of Final Program Targets, Effectiveness of Institutional Arrangements for Achieving Final Targets, Key Factors for Collaboration and Sustainability, Compliance with the 5 Principles of Program Implementation, and lessons learned from the CSRRP *Final Evaluation*.

## **CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS**

This chapter summarizes the overall findings and lessons learned from the implementation and evaluation of CSRRP. It also provides recommendations for further action based on the evidence and analysis outlined earlier.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1. Project Context and PDO

##### 2.1.1. Project Context

**The natural disasters that Indonesia experienced in 2018 caused the highest death toll in more than a decade**, due to three major disasters. The series of catastrophic events in Central Sulawesi began with a M7.5 main shock and was followed by a tsunami. The strong ground shaking **caused extensive ground deformation, liquefaction, mudflows, and submarine landslides, which then led to tsunami waves as high as six meters** (amplified by the shallow bathymetry and narrowing morphology of the bay).

The first wave reached Palu City within six minutes of the earthquake. Meanwhile, the earthquake impacted Palu City, Donggala Regency and Sigi Regency, causing severe damage to infrastructure, buildings and public assets, and destroyed three residential neighborhoods (Balaroa and Petobo in Palu, and Jono Oge in Sigi) due to liquefaction. **The disaster caused 4,402 fatalities, approximately 170,000 displaced persons, and US\$1.3 billion in economic losses estimated at 13.7 percent of regional GDP.**

In light of this catastrophic event, the Government of Indonesia requests comprehensive support from the World Bank that includes (i) technical assistance to support long-term disaster recovery and resilience activities, (ii) disbursement of existing project financing to complement the Government's recovery programs in the housing, transportation, water supply, and social protection sectors; and (iii) emergency recovery operations-to be set up under accelerated procedures-to finance the rehabilitation, upgrading and reconstruction of critical public facilities and infrastructure in affected areas, as well as to strengthen disaster risk management systems across Indonesia.

The two emergency operations are: (i) **Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP), which will support targeted communities with reconstructed and strengthened housing and public facilities**, and (ii) Indonesia Disaster Resilience Initiative Project (IDRIP, P170874), which will help improve the preparedness of the central government and selected local governments for future natural disasters. These two projects will complement other rehabilitation and reconstruction efforts in Central Sulawesi, such as the restoration of public facilities, drinking water infrastructure, waste management facilities, and transportation infrastructure by other development partners. Housing and livelihood recovery support activities by non-governmental organizations (NGOs) and other partners; and support for settlement infrastructure and road rehabilitation through ongoing investment projects financed by the World Bank.

**The Ministry of Public Works and Housing (PWOH) plays a critical role in developing resilient and life-protecting infrastructure** by administering building codes and technical guidelines, including seismic strengthening measures. Although Indonesia has developed good

standards to mitigate seismic risks, significant implementation challenges remain due to limited technical capacity at the local level to administer building codes and engineering standards; limited human resource capacity to monitor compliance of construction projects, and insufficient awareness of disaster risk standards among planners and the construction industry.

**The PWOH Ministry recognizes the need to increase the capacity of local governments and strengthen public facilities** such as health facilities, schools, and other public buildings that can potentially cause high casualties and injuries. The World Bank has collaborated with MPWH to develop a conceptual framework for a potential national seismic risk mitigation program. CSRRP provides an opportunity to pilot better design and construction practices in Central Sulawesi, which is highlighted in the seismic risk mitigation program.

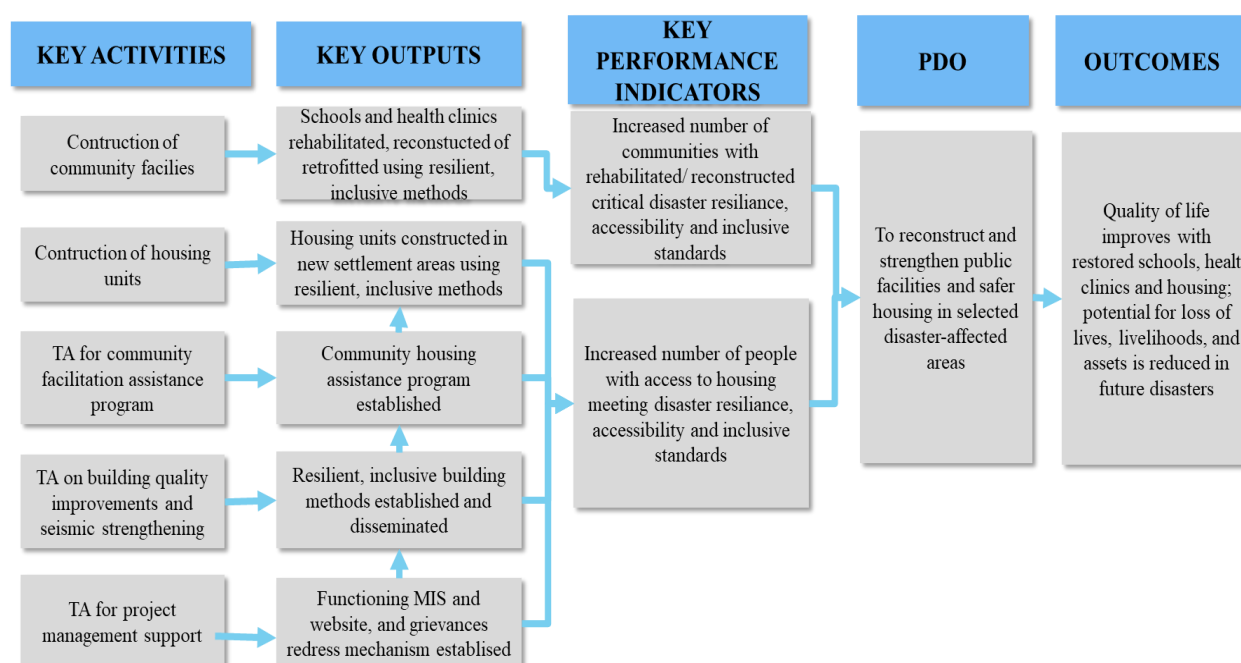
Based on Presidential Instruction No. 10/2018 on the Acceleration of Post-Earthquake and Tsunami Rehabilitation and Reconstruction in Central Sulawesi Province and Other Affected Areas, the Ministry of PWOH is responsible for carrying out **rehabilitation and reconstruction of educational, health, economic support, and basic infrastructure facilities; supervising the implementation of rehabilitation and reconstruction of these facilities, and assisting and supervising the construction of earthquake-resistant housing carried out under contractual and self-help schemes by the community**. Therefore, the CSRRP (Central Sulawesi Rehabilitation and Reconstruction Project) program was established.

CSRRP beneficiaries are estimated to reach 170,000 PAPs from Palu City, Sigi Regency, and Donggala Regency. The construction of shelters that meet project resilience standards is targeted to benefit 7,000 affected households. The restoration of disaster-affected public facilities, such as education, health, and other public service facilities, and the increase in local governments' capacity are also targets of CSRRP implementation.

### **2.1.2. Result Chain CSRRP**

Disaster-affected communities have lost access to the basic needs of shelter and health and education services. There is an urgent need to support the strengthening of rehabilitation and reconstruction of critical areas of public facilities and the construction of new housing settlements in Central Sulawesi so that disaster-affected communities can regain access to these basic needs.

The CSRRP activities, output targets, performance indicators, and outcome targets are illustrated in the *project result chain* as follows:



Source: Project Appraisal Document, World Bank, 2019

**Figure 1. Project Results Chain**

### 2.1.3. CSRRP Project Development Objective

As written in the CSRRP PAD, the Project Development Objective of the program is to reconstruct and strengthen public facilities and safer homes in post-disaster locations in Central Sulawesi.

Achievement of the CSRRP PDO will be measured through three key indicators, namely:

1. Targeted people having safer housing completed and occupied (%)
2. Served people having strengthened public facilities (%)
3. Targeted people satisfied with completed housing (disaggregated by gender) (%)

### 2.1.4. Intermediate Result

Meanwhile, the intermediate target of achieving CSRRP will be measured based on the following indicators:

#### **Component 1: Resilient construction of permanent housing units and settlement infrastructure**

- 1.1 Housing units constructed to project's resilience standards (unit)
- 1.2 Reconstructed houses provided with housing connection for water supply (%)
- 1.3 Reconstructed houses provided with sanitation system (%)
- 1.4 Constructed houses built in resettlement sites provided with direct access to a paved road network (%)
- 1.5 Women that are aware of land or property title rights in targeted project areas (%)
- 1.6 Women that are aware of employment opportunities related to recovery activities in



targeted project areas (%)

- 1.7 Women's participation in decision-making process meetings (%)
- 1.8 Non-CSRRP housing provided with water supply system (%)
- 1.9 Non-CSRRP housing provided with strengthened settlement infrastructure (%)
- 1.10 Number of kelurahan/village served with local scale infrastructure (ml)

### **Component 2: Resilient reconstruction and strengthening of public facilities**

- 2.1 Education facilities rehabilitated or reconstructed to project's resilience standards (units)
- 2.2 Health facilities rehabilitated or reconstructed to project's resilience standards (units)
- 2.3 Gender- and disability-inclusive reconstructed public facilities (%)
- 2.4 Other public facilities units constructed to project's resilience standards (units)

### **Component 3: Project implementation support**

- 3.1. MIS and project website established and Functioning (Yes/No)
- 3.2. Grievance redress mechanism established and functioning (Yes/No)
- 3.3. Complaints resolved (%)
- 3.4. Resilient and inclusive building standards are established for the project (Yes/No)

#### **2.1.5. Project Component**

Activities under CSRRP are grouped into 3 (three) components:

- a. Component 1.** Provision of resilient shelters and settlement infrastructure, includes rebuilding decent and safe shelters and settlement infrastructure in target locations. The expected impact through this component is the return of social and economic activities of beneficiary communities related to housing and settlements as before the disaster;
- b.** Rehabilitation and reconstruction of public facilities, including rehabilitation and reconstruction of education, health, and other public facilities to have the same services as before the disaster. The expected impact is that the activities of education, health, and other public facilities in the affected districts/cities run normally again;
- c. Component 3.** Activity Implementation Support, includes operational support and technical support to support the implementation and management of components 1 and 2 as well as the development of disaster risk management mechanisms in the field of public works, specifically data and information on building damage, control of building standards compliance, and disaster risk-based settlement development.

#### **2.1.6. Project Cost and financing**

The overall financing of this CSRRP project is USD 150 million or IDR 2.1 trillion, all of which comes from a loan from the World Bank without any contribution from other parties.

**Table 3. Project Cost and financing**

No.	Component/ Sub-component	Original Allocation (PAD)	
		IDR	USD*
<b>1.</b>	<b>Component 1: Resilient construction of permanent housing units and settlement infrastructure</b>	<b>1,301,025.00</b>	<b>91.30</b>
1.1.	Construction of settlement infrastructure in new locations	862,125.00	60.50
1.2.	Civil works - construction of housing units	438,900.00	30.80
1.3.	Community-based reconstruction of community-scale settlement infrastructure in Central Sulawesi	0.00	0,00
<b>2.</b>	<b>Component 2: Resilient Reconstruction and Strengthening of Public Facilities</b>	<b>453,150.00</b>	<b>31.80</b>
2.1	Education facilities	296,400.00	20.80
2.2	Health facilities	156,750.00	11.00
2.3	Other Public facilities	0.00	0.00
<b>3</b>	<b>Component 3: Project Implementation Support</b>	<b>383,325.00</b>	<b>26.90</b>
3.1	Project management, planning and engineering design, supervision, evaluation, capacity development, technical assistance	340,575.00	23.90
3.2	Contingency	42,750.00	3.00
	<b>Total Amount</b>	<b>2,137,500.00</b>	<b>150.00</b>

USD1= IDR14,250 (based on PAD)

No.	Category	Original Allocation (PAD)	
		IDR	USD
1	Works, consulting services, training and workshops, non-consulting services and goods under Parts 1.1, 2, and 3 of the Project	2.137.500	150.00
2	Grants under Part 1.2 of the Project	0	0,00
	<b>Total Amount</b>	<b>2.137.500</b>	<b>150.00</b>

USD1= IDR14,250 (based on PAD)

## 2.2. Significant Changes During Implementation

The design and implementation of the *Central Sulawesi Rehabilitation and Reconstruction Project* (CSRRP) has been in line with the original planned objectives and framework, with the relevance of the project design assessed as adequate. The project's main components, including the construction of permanent housing and improvement of public facilities, were specifically designed to address the post-disaster and long-term needs of the communities affected by the 2018 disasters. This alignment reflects appropriate and strategic project planning and implementation, ensuring key objectives of safety, resilience, and strengthened public infrastructure are achieved.

**Table 4. Significant Changes During Implementation**

No .	Activities	Project Appraisal Document (PAD)	Loan Restructuring #1 (Sept 2021)	Loan Restructuring #2 (Oct 2023)	Loan Restructuring #3 (June 2024)
<b>1</b>	<b>Restructuring Time</b>				
1.1	Restructuring time	-	September 2021	October 2023	June 2024
<b>2</b>	<b>Justification</b>				
2.1	Justification	-	Activation of community grants in category 2	Reallocation of category 2 to category 1 and changes in Intermediate Result targets	Extension of loan term
<b>3</b>	<b>Component Allocation*</b>				
3.1	Component 1	91.30	78.15	92.05	91.38
3.2	Component 2	31.80	49.92	40.61	41.38
3.3	Component 3	26.90	21.93	17.34	17.24
<b>4</b>	<b>Intermediate Result Indicator</b>				
<b>4.1</b>	<b>Component 1</b>				
a	Development of settlement infrastructure in new locations (including civil works - construction)	7,000 units	3,600 units	3,600 units	3,600 units
b	Civil works - construction of housing units	7,000 units	3,600 units	3,600 units	3,600 units
c	Community grants for self-help construction housing	-	-	27 locations	27 locations
<b>4.2</b>	<b>Component 2</b>				
a	Education facilities	200 school units	200 school units	18 education facilities	18 education facilities
b	Health facilities	33 health facility units	33 health facility units	7 units of health facilities	7 units of health facilities
c	Other public facilities	Not targeted	Not targeted	5 buildings	5 buildings
<b>5</b>	<b>Loan Closing Date</b>				
3.1	Closing Date	June 30, 2024	June 30, 2024	June 30, 2024	December 31, 2024

\*in a million USD

### 2.2.1. Loan Restructuring #1, September 2021

On April 12, 2021, the GoI requested the World Bank to: (i) reallocate loan proceeds among eligible expenditure categories, (ii) revise the Project Description; and (iii) revise the Project results framework. However, the GoI and the Bank agreed to postpone the revision of the Project results framework until the targeted restructuring after the *mid-term review* (MTR) in December 2022. On September 7, 2021, the GoI submitted a proposal to the World Bank for restructuring previously delayed in April 2021.

#### **Rationalization of Loan Restructuring #1**

##### **A. Enable Community Grant Allocation under Category 2**

The restructuring of loan 1 in September 2021 was carried out with the justification to activate the allocation of community grants in category 2. The construction of post-disaster shelters was initially carried out with a contractual approach carried out by contractors with a target of 7,000 shelter units, in this loan restructuring the target of contractually built shelters was reduced to 4,000 units only, the remaining 3,000 units were carried out with community grants through an independent shelter scheme, including environmental scale infrastructure development.

**The approved restructuring to activate this category is USD 19.25 million for independent shelter development activities and community-based infrastructure with a grant scheme.** Independent shelter development activities will be carried out in new settlement locations. In contrast, community-based settlement infrastructure can be implemented outside the designated high risk zone in new or existing locations. This activity can include the reconstruction of neighborhood roads, drainage, drinking water, sanitation, and waste.

##### **B. Changes to Component 2**

This restructuring also proposed changes to Component 2 which focuses on reconstructing school buildings, health facilities, and public facilities such as markets and government office buildings. In this restructuring, the phrase schools is changed to educational facilities because based on needs CSRRP will also finance the rehabilitation and reconstruction of university buildings, including school buildings as in the original plan. The allocation for health facilities will be increased from US\$11.00 million to US\$18.04 million to cover the proposed inclusion of additional hospitals. The proposed restructuring will also include restoring other public facilities, including markets and meeting rooms, as well as government administration buildings and facilities. US\$11.08 million is proposed to be allocated for other public facilities under Component 2. The overall allocation of Component 2 is proposed to be increased from US\$31.80 million to US\$49.92 million.

### 2.2.2. Loan Restructuring #2, October 2023

##### **A. Changes to the Project Scope**

Throughout the project, several changes were made to the initial design. These changes took into account the **evolving needs of the community, requests from the local government, and feedback from stakeholders**. These key changes include:

1. **University Development:** Initially, CSRRP activities did not include rehabilitating and reconstructing higher education institutions (universities). However, this change accommodates the addition of rehabilitation and reconstruction activities for universities.
2. **Reduction in Number of Schools:** The initial design of 200 schools was to be reconstructed or rehabilitated, but this number was later reduced considering that many schools had already been addressed with other funding sources.
3. **Construction of Government Office Buildings:** The project also included the construction of a new government office building, which was not part of the original plan. This change was made to ensure that government activities could be efficiently managed in a new, more secure structure, contributing to overall governance and administrative efficiency.

Several important factors drove the change in project scope:

1. **Requests from Local Governments and Stakeholders.** Local governments and various stakeholders play an important role in identifying and prioritizing new areas of need that were not initially covered. Their input was instrumental in ensuring that the project remained relevant and responsive to community needs.
2. **Alternative Funding:** The availability of alternative funding sources for certain facilities, such as schools, allows the project to reallocate resources to other critical infrastructure needs. This flexibility ensures that the project's financial resources are utilized in the most effective way possible.

## **B. Impact of Changes on Project Outcomes**

Changes to the project design have a significant positive impact on the overall project outcome:

- **Improved Education Infrastructure and Quality:** The university's construction has substantially boosted education infrastructure in Central Sulawesi, offering higher education opportunities and contributing to the region's long-term socio-economic development.
- **Efficient Use of Resources:** By reducing the number of schools covered under the project and utilizing alternative funding, the project was able to allocate resources more efficiently. This ensured that other critical infrastructure needs, such as government office buildings, were met without compromising the project's main objective.
- **Improved Government Activities:** The construction of new government office buildings has strengthened local governance capabilities, ensuring that administrative functions are carried out more effectively in the post-disaster context.

The design and implementation of CSRRP **has largely remained consistent with the original objectives, with necessary changes made to address emerging needs and demands without**

**compromising the main objectives.** Overall, the project has demonstrated **flexibility and responsiveness**, ensuring that the design remains relevant and effectively meets the dynamic needs of affected communities. This flexibility was critical in maximizing the project's impact and ensuring Central Sulawesi's sustainable recovery and development.

### **2.2.3. Loan Restructuring #3, June 2024**

The third loan restructuring was carried out in June 2024 as an effort to fulfill the achievement of the Project Development Objective (PDO) and Intermediate Result (IR), which proposed an extension of the loan period from June 30, 2024, to December 31, 2024, with an extension period of 6 months. The extension of the loan period also requests an update on the financial absorption plan to accommodate the progress of the implementation.

CSRRP activities require some adjustments considering the development of field conditions and prolonged land provision challenges, so project completion is expected to exceed the original loan closing date. Therefore, the CPMU proposes to extend the loan closing date to December 2024. All physical construction activities are expected to be completed by September 2024, while post-occupancy assistance activities will be carried out until December 2024. Post-occupancy assistance activities by the WTB may include preparing a Huntap settlement development plan, establishing community groups for management and maintenance, and completing the handover process.

## **2.3. Benefits of CSRRP Projects**

### **2.3.1. Beneficiaries**

CSRRP will benefit communities and local governments affected by Central Sulawesi's 2018 earthquake, tsunami and soil liquefaction. This activity is expected to provide benefits to:

1. People who lost their homes and/or were located in ZRB 4 due to earthquake, tsunami and soil liquefaction;
2. Users of built education facilities;
3. Users of built health facilities;
4. Construction workers involved in rehabilitation and reconstruction as well as facilitators for community assistance for prospective beneficiaries; and
5. People living around the relocation area.

Concerning the evaluation activities, the evaluation will focus on Component 1 beneficiaries, namely Communities that lost their homes and/or were located in ZRB 4 due to the earthquake, tsunami, and liquefaction and Component 2 beneficiaries, namely: Users of education, health and government facilities.

### **2.3.2. Benefits of Huntap and Settlement Infrastructure**

The concept of benefits in general and benefits obtained by beneficiaries, especially in terms of rehabilitation and reconstruction (CSRRP), especially related to the construction of shelters

and settlement infrastructure according to the description in the PAD and POM. These benefits are mainly related to what is called with and without projects, especially related to basic access such as houses, drinking water, sanitation, electricity, and roads.

When referring to the Result chain, the KPI related to the output of shelters and infra settlements is the increasing number of people who have access to houses that are resistant to disasters, accessibility, and inclusive standards. This can be referred to as the **direct benefit** of constructing shelters and infra settlements. Meanwhile, the expected impacts of shelter and infra settlement development, as well as indirect benefits, are that quality of life improves with housing development; the potential loss of lives, livelihoods, and assets is reduced in the event of future disasters.

### 2.3.3. Benefits of Rehabilitation and Reconstruction of Public Facilities

This component finances construction works for rehabilitation, reconstruction and structural strengthening of public facilities to improve seismic performance and safety, reduce disaster vulnerability, enhance climate resilience, and improve functionality and service standards. Therefore, the benefits expected to be obtained are related to strengthening the structure of public facilities resistant to disasters and are also inclusive for all beneficiary groups including people with disabilities.

The benefits of Rehabilitation and Reconstruction of public facilities refer to the description contained in the *result chain*, namely Increased number of communities that have been rehabilitated/reconstructed in terms of resilience to critical disasters, accessibility, and inclusive standards, which can be referred to as **direct benefits**. While the expected impacts are Quality of life improved with the restoration of schools and health clinics; potential loss of life, livelihoods, and assets reduced in the event of future disasters, which can be referred to as **indirect benefits**.

### 2.3.4. Economic Analysis

A cost-benefit analysis (CBA) methodology will be used to assess the benefits of CSRRP. The main objective is to evaluate the economic benefits of component 1 and component 2. CBA will model the potential benefits of specific building types. This analysis produces two main outputs - *Net Present Value* (NPV) and *Economic Rate of Return* (ERR).

The CBA relies on principles derived from the *Triple Dividend of Resilience Framework* (TDRF). The TDRF outlines three realistic development benefits of investing in *ex-ante* disaster risk management:

1. **Avoiding losses during disasters:** This includes saving lives and reducing the number of people affected, minimizing direct costs to infrastructure and other assets, and reducing indirect and direct economic losses,
2. **Stimulating economic activity due to reduced disaster risk;** Risk reduction to engender investor confidence, expand corporate planning horizons, and increase land value, and



3. **Co-benefits, or uses, of specific *disaster risk management* (DRM) investments;** for example, improving community-based disaster preparedness can lead to increased involvement of women in community-level activities, and strengthening DRM capacity can lead to improved governance and more organized social structures.

Constrained by data availability, CBA focuses on measuring the benefits of (i) avoiding losses when disasters occur and will thus ignore the actual benefits of disaster-resistant buildings.

Data sources. Inputs for CBA come from (i) survey data such as the National Labor Force Survey (Sakernas) and the National Socio-Economic Survey (Susenas), (ii) secondary data sources such as historical disaster data from BNPB, published statistics on the number of health workers, inpatient and outpatient visits, teachers, students, and (iii) inputs from existing research such as the social benefits of education over years.

The methodology for Component 1 and Component 2 measures the economic benefits of constructing permanent housing units and settlement infrastructure. For Component 2, economic benefits resulting from the reconstruction and strengthening of public facilities are estimated. The overarching principle is to measure the building-specific economic benefits (houses, primary schools or health facilities) generated.

#### **2.3.4.1. Benefit Analysis Method for Shelters and Settlement Infrastructure**

**Benefits from permanent housing and permanent settlement infrastructure.** Household members who have been displaced as a result of the 2018 Central Sulawesi earthquake are living in temporary shelters ("Huntara"). While these temporary shelters provide basic amenities for disaster victims, sanitation and hygiene are less than optimal, as toilets are shared and the main source of clean water is provided through water containers provided by NGOs and Local Government. Component 1 aims to assist households displaced by disasters in relocating to new settlement areas and providing housing units for disaster-affected victims.

This CBA assumes that the economic benefits of component 1 come from permanent settlement infrastructure and the construction of approximately 7,000 (3600 in the *restructuring paper*) new housing units. Comparing the 'with project' scenario with the 'without project scenario', implementation of component 1 will result in improved access to drinking water, sanitation, and handwashing stations for affected households. To monetize the value of improved access to drinking water and sanitation, it is assumed that **housing will reduce the number of healthy lives lost to premature death or disability (*Disability Adjusted Life Years/DALYs*) by half**. Multiplying the difference in years lost due to premature death/disability (DALYs) by the annual average income will yield the monetary value of the economic benefits of housing.

#### **2.3.4.2. Benefit Analysis Method for Rehabilitation and Reconstruction of Public Facilities**

**Benefits from Reconstruction, Rehabilitation, and Retrofitting of Public Facilities.** Given that all reconstructed, rehabilitated and retrofitted buildings will receive **structural upgrades, all buildings are expected to generate benefits in terms of avoided risk of death, avoided repair costs and avoided disruption to economic activity.**

However, reconstruction, rehabilitation, and retrofitting have different baseline scenarios for economic activity. **Reconstructed buildings** are expected to generate the highest economic benefits, as the baseline scenario assumes that these buildings are currently not operating or there is a severe lack of capacity for the building to operate at full capacity. The methodology assumes that **schools are operating at 30 percent capacity** before reconstruction, but for **health facilities, the current operational capacity is assumed to be 0 percent**. **Rehabilitation** assumes that buildings are currently operating, but not at full capacity. The buildings (schools and health facilities) are assumed to be at 50 percent capacity before rehabilitation, and 100 percent after the buildings have been rehabilitated in 2021. This implies that the **impact of project investments on rehabilitated buildings will be 50 percent of the total benefits generated from future economic activities**. The buildings to be improved are existing and fully operational buildings that will receive structural upgrades, and thus only generate economic benefits from structural upgrades. Due to data limitations, the CBA does not measure the economic benefits of the loss of environmentally sustainable assets or buildings.

**Component 2. Health facility benefits.** Health facility benefits derived from the provision of outpatient services. To estimate the economic benefits of health care, CBA places a monetary value on the number of healthy days gained as a result of seeking health care. An *ordinary least squares* (OLS) regression was used to estimate the number of healthy days gained as a result of health care seeking for children aged 15 to 65 years. The dependent **variable** was the **number of days the individual was sick**, while the covariates were whether the **individual sought outpatient care**, and demographic controls were included in the OLS model. The estimated coefficient for the variable indicating whether an individual sought outpatient care can then be interpreted as the **number of healthy days gained as a result of seeking outpatient care**. The implicit assumption imposed in this methodology is that all outpatient visits result in a constant level of economic benefit. In addition, variance in the benefits of outpatient care is possible - for example, the benefits of receiving an early diagnosis for cancer are likely to be much higher than visits for acute cases. This implies that the economic benefits of health care are likely to be greater than the monetary value estimated in this CBA.

**Benefits from primary schooling.** To estimate the economic benefits of education, CBA uses the **concept of social benefits to education**, which includes not only private benefits to education, but also positive externalities and non-market effects. The resulting estimates for the social benefits to education usually ignore the actual social benefits, given the ease of accounting for overall social costs, but there are difficulties in accounting for social benefits.<sup>1</sup> **This CBA methodology uses Joshi et al. (2019) on the social benefits of education - a one-year increase in average years of schooling leads to a 7.96 percent increase in wages.** To apply Joshi et al. (2019) on the social benefits to education, a matrix of students in each year of study is created, and the annual earnings of those who complete each year of study. For example, if the number of students in Year 10 (the first year of high school) is 30, while the average income of those not in high school is US\$1,000, then the economic benefit generated

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<sup>1</sup> Psacharopoulos, George; Patrinos, Harry Anthony. 2018. *Returns to investment in education: a decennial review of the global literature*. Policy Research working paper; no. WPS 8402. Washington, D.C.: World Bank Group.

from these students is US\$2,388. Summing up the years of study for a particular building will yield the economic benefits of education from that building. This calculation is repeated for primary schools, and junior secondary schools. It should be noted that this methodology does not account for dropouts between years of study.

### 2.3.4.3. Value Statistic of Life

Monetization of avoided mortality using the VSL concept with a 2024 figure, with the "**benefit transfer**" method, and VSL elasticity equal to PAD, that method for estimating VSL for Indonesia is based on VSL estimates from developed countries (See Cropper and Sahin, 2009). We chose a VSL estimate from the US Environmental Protection Agency that equaled US\$9.7 million. Adjustment of the US-based VSL requires the ratio of Indonesian and US GDP per capita. In addition, following the recommendation of Cropper and Sahin (2009) to account for differences in risk preferences between Indonesians and Americans, a VSL elasticity of 1.5 was assumed.

**Table 5. VSL Indonesia calculation**

Indicator	Formula	Start of Project (2016) (\$)
VSL America	$VSL_{USA}$	9.700.000
Indonesia's real GDP per capita (PPP)	$Y_{IDN}$	10.766
US real GDP per capita (PPP)	$Y_{USA}$	53.399
Income elasticity of VSL	$\epsilon$	1,5
VSL Indonesia estimation	$VSL_{IDN} = VSL_{USA} \times (Y_{IDN}/Y_{USA})^{\epsilon}$	878.156

### 2.3.4.4. NPV and IRR

The net present value of health facilities, primary schools, junior secondary schools and houses was calculated. Assuming a 10 percent discount rate, the NPV and IRR are summarized in **Table 6**, while **Table 7** summarizes the net economic benefits of Component 1, Component 2, and the overall project. Over the next 17 years, the NPV of the overall project is estimated at US\$160 million, while the IRR is estimated at 25 percent.

**Table 6. Summary of NPV and EIRR of Health, Occupation and Housing Facilities**

	Health Facilities	Education Facilities	Housing
<b>NPV (US\$)</b>	94.159.162	35.011.455	30.821.329
<b>IRR</b>	66%	30%	15%

**Table 7. Summary of NPV and EIRR of Component 1 and Component 2**

	Component 1	Component 2	Project
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<b>NPV (US\$)</b>	30,821,329	129,170,616	159,991,945
<b>IRR</b>	5%	45%	25%

#### 2.3.4.5. Sensitivity Analysis

A project sensitivity analysis was conducted on three variables:

1. Statistical age value,
2. The possibility of an earthquake in Central Sulawesi, and
3. O&P changes.

The sensitivity analysis results are shown in the table above, interpreted in terms of the percentage change in each variable required to shift the NPV from positive to negative - known as the "switching value." Ceteris paribus, the project can sustain a 78 percent decrease in the statistical life value, or a 210 percent increase in operating and maintenance costs each year or a decrease in the chance of another earthquake in Central Sulawesi from 0.087 to 0.037, and still be economically viable.

**Table 8. Project Sensitivity Analysis**

<b>PAD Sensitivity Analysis Variables</b>	<b>Comp-1</b>	<b>Comp-2</b>	<b>Project</b>
VSL Reduction (Baseline: 878,156)	-23%	Positive throughout	-78%
Switching value probability of earthquake in Central Sulawesi (Baseline: Probability of 0.087)	As low as 0.073	Positive throughout	As low as 0.037
Increase in O&M costs as a percentage of investment outlay (Baseline: 10% of investment outlay)	60% increase in O&M costs annually	650% increase in O&M costs annually	210% increase in O&M costs annually

## 2.4. Project Efficiency Concept

According to the KBBI, the word efficient means to do work precisely and to be able to carry out tasks carefully, and efficiently. The general understanding explains that efficiency is an effort that requires completing work in a timely, fast and satisfactory manner. So efficiency is closely related to timeliness without spending excessive costs or costs.

In another sense, an economic activity can be considered technically efficient if it produces maximum output with certain resources or a certain amount of output using minimal resources. Kumbhaker and Lovell (2000) in Abidin and Endri (2009) said that technical efficiency is one of the components of overall economic efficiency. However, to achieve economic efficiency, a company must be technically efficient. To achieve the maximum profit level, a firm must be able to produce at the optimal output level with a certain amount of input (technical efficiency) and produce output with the right combination at a certain price level.

Efficiency Assessment and Final Evaluation CSRRP is classified into 2 (two) definitions as

follows:

## 1. Overall project investment efficiency

Project Efficiency is how resources and inputs are economically converted into outcomes. This section briefly describes whether the costs allocated in achieving the program/activity objectives are reasonable compared to the benefits and economic value for money aspects. The PCR presents a detailed efficiency analysis, including the underlying assumptions about costs and benefits, and other information that supports the analysis. It will also present the concepts of NPV, BC/ratio and also EIRR as a measure of the usefulness of a project.

**Table 9. concept of NPV, BC/ratio and EIRR**

<i>Net Present Value (NPV)</i>	<i>Benefit-Cost Ratio (B/C Ratio)</i>	<i>Economic Internal Rate of Return (EIRR)</i>
NPV measures the difference between benefits (revenues) and costs (expenses) that have been <i>present-valued</i> .	The B/C Ratio measures the ratio of benefits to costs that have been present-valued.	EIRR is measured through an interest rate that describes the ratio of benefits (revenue) to costs (expenses), each of which is present value at zero.
The project is said to be worthwhile if $NPV > 0$ .	The project is beneficial if the B/C ratio $> 1$ (one).	The project is beneficial if the EIRR generates returns or profit levels $> Discount Rate$ .

## 2. Efficiency in terms of housing units, settlement infrastructure and public facilities

In relation to CSRRP activities, the unit cost of infrastructure activities is disaggregated according to the type of infrastructure, namely:

### A. Huntap:

a. **Area Shelter/Satellite Shelter;** Land is provided by the local government, settlement infrastructure by the central/regional government. Site planning, *prototype* design, and detailed design of regional and satellite housing are carried out by planning consultants, and contractors carry out construction for regional housing and satellite housing.

### b. Independent Huntap

- 1) **Grant;** Huntap land is prepared by the community, roads, water and electricity networks are in accordance with the existing, while the contractor carries out the construction.
- 2) **Contractual;** For contractual Huntap Mandiri, a contractor carries out construction but still involves the land-owning PAPs as laborers. The PAPs, accompanied by a community facilitator, can also supervise the construction process.

**B. Settlement Infrastructure: Settlement** infrastructure development is carried out at the regional, satellite, and independent huntap locations and in situ huntap. Contractors carry out the construction of settlement infrastructure for regional and satellite housing. In contrast, the construction of settlement infrastructure for housing areas with more than 15

units and in-situ housing will be carried out independently. The minimum settlement infrastructure includes:

- a. Residential Road
- b. Water Supply System
- c. Drainage Network System
- d. Wastewater Network
- e. Waste System
- f. Green Open Space
- g. Fire Fighting Facilitation

When viewed from the pattern of implementation of construction development, it can be divided into 2 patterns of activity:

- a. Neighborhood Scale Infrastructure; The development process is carried out in a self-managed manner by the community.
- b. Settlement Infrastructure; The development process is carried out on a contractual basis (contractor)

**C. Rehabilitation and Reconstruction of Public Facilities;** This component includes rehabilitation and reconstruction of public facilities in Palu City, Donggala Regency, Parigi Moutong Regency and Sigi Regency. Rehabilitation activities are carried out on moderately to severely damaged public facilities in-situ that are not located in Disaster Prone Zones (ZRB) 4. While reconstruction activities are carried out for severely damaged public facilities both in their original location and those that need to be moved to safer locations, including permanent housing locations under Component 1. Reconstruction activities cannot be carried out in ZRB 3 and 4. Public facilities funded by CSRRP include educational facilities, health facilities, meeting halls, markets, and other facilities proposed by the district / city government. All Rehabilitation and reconstruction development activities are carried out on a contractual basis.

Due to data limitations, the efficiency of each type of settlement infrastructure will only focus on calculating the efficiency of shelter buildings with the RISHA model compared to conventional RISHA buildings in general. This efficiency value does not only look at the cheapness or high cost, but also its usefulness.

## **2.5. Project Effectiveness Concept, Infrastructure Effectiveness**

### **2.5.1. Project Effectiveness**

According to KBBI, the word effective is related to the word effect; effective means causing an effect, effective, successful, and applicable. In this word, effective can be said to be a result that leads to positive and successful outcomes. However, in another general sense, effective is an effort to achieve the expected goals, results, and targets promptly. So it can be concluded that a job can be effective if the previously set goals are successfully achieved.

According to Siagian (2012) effectiveness is the utilization of resources, facilities and infrastructure in a certain amount that is consciously predetermined to produce a number of



goods for the services of the activities it carries out. Effectiveness shows success in achieving or not the goals that have been set. If the activity results are closer to the target, it means that the effectiveness is higher. It can be concluded that the definition of effectiveness is a measure that states the target, which can be in the form of quality, quantity, or time, which has been achieved by management and determined in advance by management.

About CSRRP, the indicators used in analyzing program effectiveness are KPI *outcome* indicators (PDOs and *Intermediate results*), which are also part of the scope of this CSRRP Evaluation. If the *outcome* indicators are achieved, it shows that the program is on the right track according to the program design and achieves the targets set, so it can be said that the program is running effectively.

Furthermore, the factors that influence achievement will be analyzed. The analysis is carried out by juxtaposing and correlating the cause-and-effect relationships between the indicators themselves, as well as with survey data that are not *outcome* performance indicators, *outputs* in implementation (*intermediate results*), and secondary data from SITABA PU WEB and other sources (reports, presentations, etc.).

### 2.5.2. Infrastructure Effectiveness

To elaborate on Infrastructure Effectiveness, the following definitions need to be conveyed namely:

1. **Quality of Infrastructure:** Conformity with technical specifications. Infrastructure quality/quality: in the scope of construction work is the conformity between the work results and the technical specifications and other requirements of the service user within the scope of cost and time that has been determined.
2. **Infrastructure Functionality:** said to be functional when the infrastructure built has met the needs of the service.
3. **Infrastructure Effectiveness:** Infrastructure effectiveness is thus a combination of the following notions:
  - a. Infrastructure Quality
  - b. Infrastructure Functionality
  - c. Usability
  - d. Institutional O&P, among others
    - 1) Home: Occupancy & LTO
    - 2) Settlement Infrastructure: BASTO
    - 3) Public Facilities: BASTO

Some of the factors that affect construction Effectiveness include:

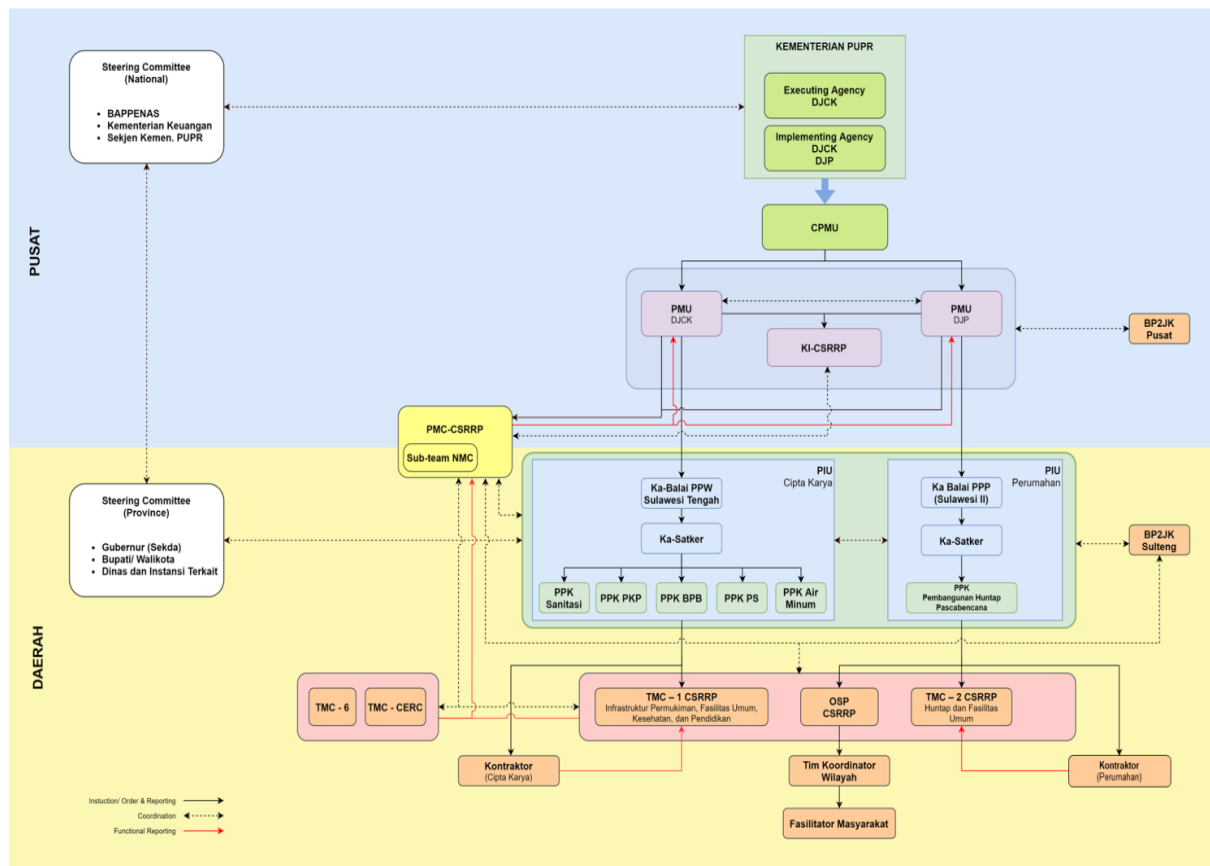
1. **Building Materials:** Using high-quality building materials will increase the durability and lifespan of the construction project. The materials should conform to the set standards and specifications.
2. **Design:** The quality of the design is very important to achieve a good end result. A good design considers safety, functionality, and aesthetics.



- 3. Construction Techniques:** Proper and correctly applied construction methods can improve the quality of the project. The skills and expertise of construction workers also play an important role.
- 4. Supervision:** Careful supervision during construction is necessary to ensure that the plans and specifications carry out the work. This includes supervision of materials, construction processes, and quality of work.
- 5. Standards and Regulations:** The quality of construction is also determined by the extent to which the project complies with applicable standards and regulations. These include safety, environmental, and health standards.
- 6. Maintenance:** Good care and maintenance after completion of construction will ensure that the project remains in good and safe operation in the long run.

## **2.6. Concept of Effectiveness of Institutional Arrangement**

The implementation of CSRRP involves various components and institutions at the central and regional levels. CSRRP implementing institutions at the central level include the steering committee consisting of several related ministries, the *Central Project Management Unit* (CPMU), the *Project Management Unit* (PMU) consisting of the PMU of the Directorate General of Human Settlements and the PMU of the Directorate General of Housing, the Construction Services Procurement Agency (BP2JK), and the consultant team. CSRRP implementers at the regional level include provincial and district/city governments as *steering committee*, *Project Implementation Unit* (PIU) consisting of PIU Cipta Karya and PIU Penyediaan Perumahan, BP2JK at the provincial level, and a team of consultants. The organizational structure of CSRRP can be seen in the following figure:



**Figure 2. CSRRP Organizational Structure**

Not only the actors, the Ministry of PWOH related to the CSRRP program has also developed a Stakeholder Engagement Plan (SEP) document to encourage participation from affected communities and interested parties to ensure that the design and overall activities are carried out in a participatory and inclusive manner; and to minimize potential risks to the environment and social in the future.

Grouping stakeholders at different levels is necessary to identify appropriate communication and engagement methods during project implementation. The groupings are described as follows:

**People, social groups, and organizations that will benefit directly and indirectly from the project.**

Target beneficiaries include: (i) students and the wider community who will access public facilities addressed through the project (i.e. education and health facilities - component 2), (ii) IDPs currently in temporary shelters, tents, or staying with relatives; (iii) communities currently occupying 'red zones' and willing to relocate to safer areas (component 2).

**Potentially negatively affected communities** include local communities in the target relocation areas. The nature of the impact will be determined based on their consent and willingness to accommodate the newcomers, which will be monitored from time to time. The safety and possible negative impacts on local communities will be the responsibility of the project implementers. The project will not proceed if the resulting negative impacts are judged to be too high and cannot be properly managed despite efforts to minimize them.

**Interested groups include:** (i) local government agencies, (ii) non-governmental organizations and other development partners supporting rehabilitation and reconstruction efforts in Central Sulawesi, and (iii) representatives from specific advocacy groups, including the urban poor movement, environmental advocacy and so on. Engagement will be conducted to ensure that information on project activities and implementation is accessible to the public and that community concerns and feedback are accommodated as part of the overall project design and implementation. Identification of these interested groups is ongoing and will continue throughout project implementation.

**Implementing agencies and agencies with authority for environmental and social risk management** including institutions that have influence and make decisions related to project implementation. This group mainly includes central government agencies such as the Ministry of Public Works and Housing (PWOH), the National Disaster Management Agency (BNPB), the Ministry of National Development Planning/National Development Planning Agency (Bappenas), the Ministry of Finance, the Ministry of Environment and Forestry (KLHK), and the Ministry of Agrarian and Spatial Planning/National Land Agency (ATR/BPN), as well as relevant government agencies (DLH, Housing Office, Public Works Office, Spatial Planning Office, and Petanahan Regional Office) in the affected areas. The level of involvement will depend on their respective roles and authorities in environmental and social risk management.

To obtain this information, it is necessary to conduct a primary survey of relevant actors either through *in-depth interviews* to see the extent to which the division of tasks and roles in POM is running effectively. Analysis is carried out by looking at data on the progress of work implementation between the realization and target of work implementation and also KPI achievement data to show that related institutions are running effectively to achieve goals including key collaboration factors for sustainability.

## **2.7. Key Factors for Institutional Collaboration and Sustainability**

### **2.7.1. Institutional Collaboration**

**One of the principles applied in CSRRP is collaboration and integration;** CSRRP is one of the post-disaster recovery programs in Central Sulawesi that actively involves all *stakeholders*, including the government, private sector, and the community. Collaboration between actors aims to realize integrated efforts in order to optimize the efficiency of the resources involved. The Government of Indonesia has developed a Master Plan for Post-Earthquake and Tsunami Rehabilitation and Reconstruction in Central Sulawesi as a reference document for all interested parties. The existence of various activities in CSRRP implementation needs to prioritize integration with other activities. This collaboration must occur at every stage of CSRRP activities.

### **2.7.2. Sustainability**

One of the principles in CSRRP is sustainability, which refers to the sustainability of project outcomes. Sustainability of project implementation outcomes requires: (i) quality control mechanisms in building construction; (ii) design and construction of infrastructure that is

acceptable and appropriate to local conditions; (iii) design with high technical standards, by applicable construction rules and standards, and learning from existing good practices; (iv) continuous capacity building and knowledge management; (v) operational and maintenance procedures and funding; (vi) active community involvement

Sustainability is essentially a cross-cutting concept that involves various aspects, with the three main aspects being environmental, social, and economic. Indeed, this concept began as an idea about environmental concerns but expanded into various aspects of human life. It is not only about the balance of nature, but also about things like educational equality, welfare, and economic development.

The definition of sustainability itself was coined by the United Nations in 1987 as "*meeting the needs of the present, without compromising the ability of future generations to meet their own needs*". From this definition, it can be illustrated that the concept of sustainability is a concept that seeks to make life better, both for current and future generations.

In relation to CSRRP, CSRRP activities are sustainable when all activities are fully utilized and operational so that the *outcomes of CSRRP* are that quality of life is improved by restoring schools, health clinics and housing, and the potential loss of lives, livelihoods and assets is reduced in the event of future disasters.

Elements of sustainability include:

1. Budget for program sustainability, especially in Local Government
2. Strong institutional capacity of local government and community
3. Running operation and maintenance system

## **2.8. Social and Environmental safeguard Management Compliance and 5 Principles of Project Implementation**

### **2.8.1. Social and Environmental Safeguard Management Framework**

The CSRRP environmental and social management guidelines have been outlined in the *Environmental and Social Management Framework (ESMF)* document. The ESMF is an operational technical guide for the CSRRP program prepared by the Ministry of PWOH as the main environmental and social management guideline for all CSRRP stakeholders. The ESMF document describes a set of principles, rules, procedures and institutional arrangements to screen, assess, manage and monitor measures to mitigate project investments' environmental and social impacts. The ESMF, which is a separate document from the POM, was prepared concerning the environmental and social requirements of the Indonesian Legislation and the World Bank approved *Environmental and Social Framework*. It is prepared before, during and after project implementation.

#### **A. ESMF as an Operational Reference**

The ESMF, a separate document from this POM, will be used as the main environmental and social management guideline for all CSRRP stakeholders. The ESMF document describes a set of principles, rules, procedures and institutional arrangements to screen,

assess, manage and monitor measures to mitigate project investments' environmental and social impacts.

## **B. Scope**

The guidelines adopt GoI laws and regulations in line with the World Bank's environmental and social standards (*ESS*), which include:

- ESS 1 Assessment and Management of Environmental and Social Risks and Impacts;
- ESS 2 Labor and Working Conditions;
- ESS 3 Resource Efficiency and Pollution Prevention and Management;
- ESS 4 Public Health and Safety;
- ESS 5 Land Acquisition, Land Use Restrictions and Involuntary Resettlement
- ESS 6 Biodiversity Conservation and Sustainable Management of Natural Resources;
- ESS 7 Indigenous Peoples and Masyarakat Adat;
- ESS 8 Cultural Heritage; and
- ESS10 Information Disclosure and Stakeholder Engagement.

The requirements under ESS 5 apply to resettlement activities of people living in the red zone, whether they are disaster survivors or not. A summary of the analysis of potential environmental and social risks and mitigation measures for each ESS can be found in the ESMF document.

The ESMF applies to all components and activities financed by the CSRRP and Associated Facilities as defined in the ESF regardless of the source of funding i.e. to the extent that the project implementer has control or influence over such Associated Facilities. Associated facilities are activities that are: i) directly and significantly related to the project; ii) implemented, or planned to be implemented concurrently with the project; and iii) necessary for the project to be viable and would not be constructed, expanded or undertaken in the absence of the project.

The ESMF document aims to:

1. Identify and determine the typology of projects eligible for support under CSRRP through a screening process;
2. Identify and assess the potential environmental and social impacts of proposed project and sub-project activities;
3. Establish clear standards, procedures and methodologies to guide environmental and social screening and subsequent risk assessment and classification;
4. Establish standards and procedures for the management of identified risks and impacts from project and sub-project activities by the mitigation hierarchy;
5. Determine the appropriate roles and responsibilities of the identified stakeholders and outline the reporting procedures required for environmental and social management and monitoring;
6. Determine the training, capacity building and technical assistance required to implement the provisions of the ESMF and related instruments successfully; and

7. Establish a budget for the implementation of the ESMF and related instruments.

The ESMF builds on the environmental and social management measures contained in the NSUP and CERC, with additional measures for relevant provisions of the Environmental and Social Standards (ESSs) applicable under the ESF. Such further measures specifically addressing disaster prevention, labor management, community, health and safety risks-including Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA)-will also be available for activities under CERC-NSUP.

### **C. Environmental and Social Management Procedures**

CSRRP will be implemented in a post-disaster context; therefore, environmental and social management should consider the level of potential risks, impacts, and sensitivity of the post-disaster baseline. Sub-projects financed under this project are reviewed to: a) determine eligibility for financing; and b) identify key environmental and social risks and potential impacts and determine appropriate E&S instruments to assess and manage these risks. Decisions will be made by E&S specialists at the PIU and PMC concerning the type and scope of assessment and instruments required for each sub-project investment/activity.

The project's Stakeholder Engagement Plan (SEP) document guides overall stakeholder engagement, public consultation, and community facilitation. The SEP outlines the agreed strategies and actions to implement the project in a manner that promotes inclusive community participation and engagement of all CSRRP stakeholders. The following figure outlines the key steps and decision points for all sub-projects.

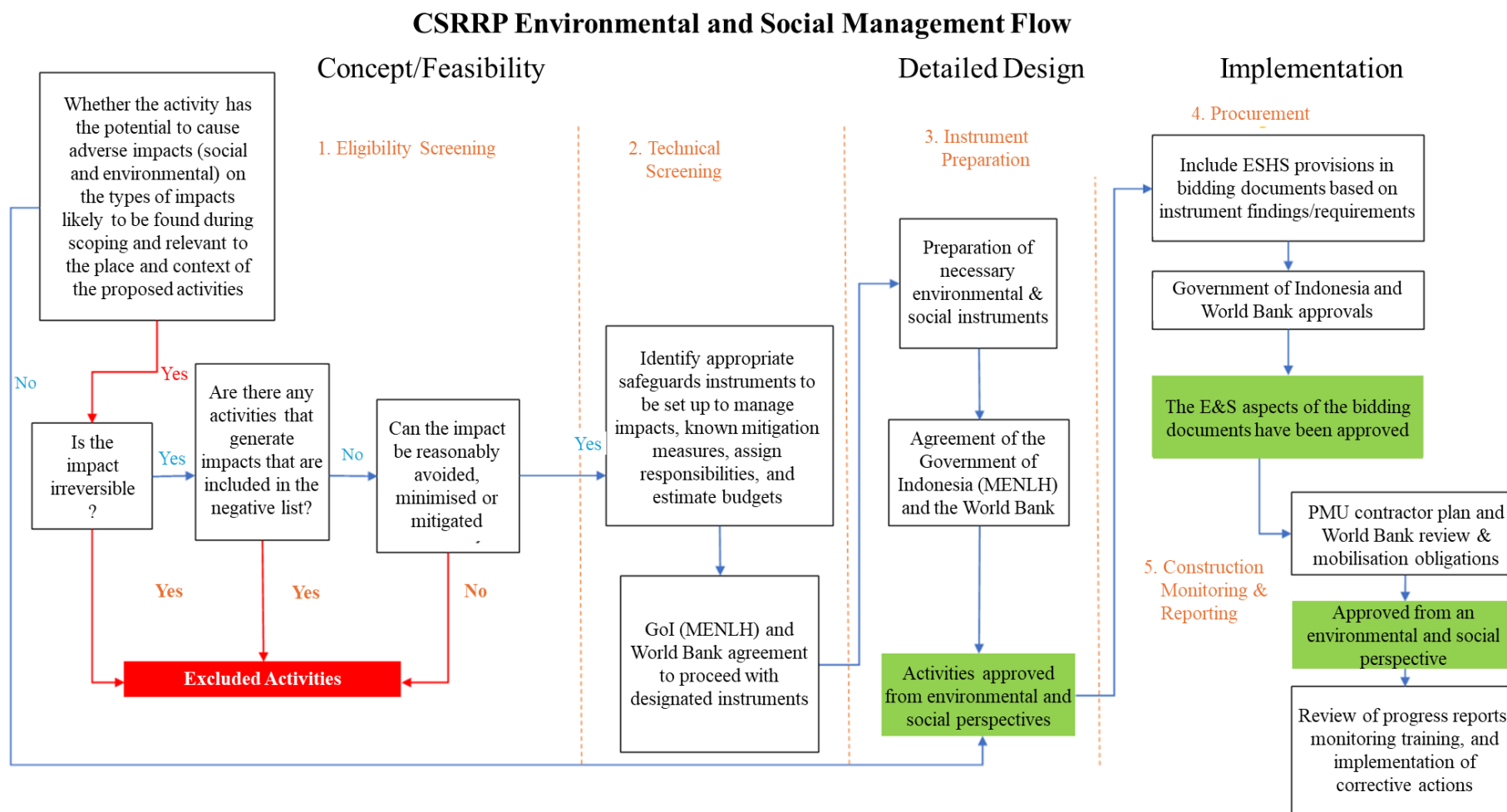


Figure 3. Flow of CSRRP Environmental and Social Management



The CSRRP implementation process prioritizes *Build Back Better* by referring to the principles of earthquake resilience, universal access, green building, inclusiveness, and gender responsiveness. In addition, the implementation of the CSRRP program will implement the management of building debris resulting from reconstruction rehabilitation and mitigation of gender-based violence that is prone to occur in disaster areas.

As is known, there are at least 5 (five) principles in project implementation, namely *Sexual Exploitation and Abuse SEA / Gender Based Violence* (GBV) (Mitigation of gender-based violence), universal design, earthquake-resistant buildings, *sustainable buildings* and water sensitive *urban* design.

### **2.8.2 Sexual Exploitation and Abuse (SEA)/ Gender Based Violence (GBV)**

SEA/GBV is an umbrella term for any harmful behavior perpetrated against a person based on societal gender roles that distinguish between men and women, including behavior that results in physical, sexual, or mental suffering, threats of harm, coercion, and or other behavior that restricts a person's freedom. Mitigation and handling of Gender-Based Violence (GBV) refers to several Indonesian laws and regulations, including:

1. Presidential Instruction No. 9 Year 2000 on Gender Mainstreaming in National Development
2. Law No. 35 of 2014 on child protection
3. Law No. 23 of 2004 on the elimination of domestic violence
4. The World Bank's environmental and social *standards* (ESS) under the *Environmental and Social Framework* (ESF).
5. CSRRP *Environment and Social Management Framework* (ESMF-CSRRP)

Long-term preventive measures that can be taken in the CSRRP program are as follows:

1. Create a women and children empowerment program (Local Government Program);
2. Rebuild family and community structures and strengthen support systems (Local Government Program);
3. Plan services and facilities that are accessible, safe and effective;
4. Work with litigation and non-litigation systems that are in line with human rights;
5. Monitor GBV case data reporting to understand the magnitude of the GBV problem/record and its response;

Provide worker training provided by other organizations on GBV, GBV guidelines, SOPs and other relevant materials to ensure that all workers:

1. Have a basic understanding of GBV and GBV guidelines;
2. Can carry out prevention efforts through effective activities by their role in the disaster context; and
3. Understand how and where to report GBV cases for assistance.

Based on the explanation of the long-term preventive measures that can be taken in the CSRRP program, the recommendations for mitigating GBV risks in the CSRRP program are as follows:

### **Phase 1: Establishment of GBV Focal Points and GBV Specialists**

1. Support and Ensure the GBV risk mitigation system's sustainability and handling in NSUP-CERC and CSRRP Projects.
2. Develop a Code of Conduct for Project Implementers and FGRM GBV strategy in NSUP-CERC and CSRRP Projects.
3. Coordination with relevant agencies for GBV mitigation and management programs in NSUP-CERC and CSRRP Projects.
4. Recording, Reporting, and Ensuring the appropriate authorities handle GBV cases.

### **Phase 2: Coordination with Related Agencies and Service Providers in Central Sulawesi**

For GBV mitigation and management activities in the NSUP-CERC and CSRRP projects to run well and sustainably, coordination with the existing system in Central Sulawesi is very important.

Related agencies include:

1. Provincial and district DP3A
2. KBG handling service provider

### **Phase 3: Development of FGRM KBG that is integrated with the existing system in Central Sulawesi**

1. The FGRM system is confidential, has a security and protection system (*safety*), non-discriminatory, and respectful.
2. The FGRM system in the project needs to be integrated with the existing system in central Sulawesi.
3. The flow of the system mechanism must be clear and contained in the MIS (SITABA) so that the community can reach it.

### **Phase 4: Workshop and Training for Project Implementation**

1. Workshop and Training for CPMU, PMU, PIU, PPK, PWOH Staff, and supporting Consultants.
2. Workshop and Training for Community Facilitators.
3. Workshop and Training for Contractors
4. Workshops and Training for Workers

### **Stage 5: Drafting the Code of Conduct**

Having a *code of conduct* for all project actors to *prevent sexual exploitation and abuse* (PSEA = *preventing sexual exploitation and abuse*) committed by other humanitarian workers. The code of conduct applied in all CSRRP physical activities is a shared responsibility between the government, contractors, and supervision consultants. To raise awareness of the code of conduct, it must be included in procurement requirements and the management of EHS activities in construction activities.

### **Stage 6: Assessment of the implementation of *Harmonized Bidding Document* and contract documents related to GBV mitigation**

The assessment is based on: i) Harmonized Bidding Document; ii) NSUP-CERC EROM; and iii) ESMF-CSRRP. If civil works under NSUP-CERC and CSRRP projects need to mitigate against Gender-Based Violence (GBV) in civil works, the contractor will be responsible for:

1. Conducted GBV prevention training for contractors and project workers,
2. Report GBV incidents to the GBV *focal point* and *Service Provider*. Allocation for handling project-related cases will be the responsibility of the Contractor.

**Table 10. Role of Parties in GBV Mitigation**

World Bank	Government	Contractor	Community
<ul style="list-style-type: none"> <li>• Perform review and approval functions</li> <li>• Provide technical support</li> <li>• Provide partners with an understanding of the requirements and processes associated with GBV.</li> <li>• Conduct a GBV risk assessment</li> <li>• Conduct an assessment of the client's capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Responsible for the management and oversight of GBV risks</li> <li>• Conduct a GBV risk assessment</li> <li>• Manage and oversee GBV risk mitigation measures</li> <li>• Monitoring reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Implement and oversee required mitigation measures</li> <li>• Overseeing and enforcing workers' code of ethics and standards of conduct</li> <li>• Follow accountability, response and handling requirements in case of a case</li> </ul>	<ul style="list-style-type: none"> <li>• Engage in a consultation process at the time of risk assessment to identify relevant potential risks.</li> <li>• Become a partner in risk management</li> <li>• Participate in receiving information on project risks and help report cases if there are any.</li> </ul>

### 2.8.3 Universal Design

Referring to the *United Nations* (2007) document, universal design is the design of products, environments, programs and services that will be usable by all people to the maximum extent possible without the need for adaptation or special design. Universal design will not exclude assistive devices for certain groups of people if these devices are needed.

The main goal of universal design is to allow as many users as possible to access and utilize.

Some regulations and standards in Indonesia relating to universal design:

1. Law No. 8 Year 2016 on Persons with Disabilities;
2. Government Regulation No. 42 of 2020 on accessibility to settlements, public services and disaster protection for persons with disabilities
3. PWOH Regulation No. 14 of 2017 concerning Building Facilities Requirements
4. Minister of Health Regulation No. 24 of 2016 concerning Technical Requirements for Hospital Buildings and Infrastructure
5. Minister of Social Affairs Regulation No. 7/2017 on Social Habilitation and Rehabilitation Standards for Persons with Disabilities
6. Minister of Social Affairs Regulation No. 16 of 2019 concerning National Standards for Social Rehabilitation

7. Minister of Education and Culture Regulation No. 33 of 2008 concerning Facilities and Infrastructure Standards for Special Elementary Schools, Special Junior High Schools, Special Senior High Schools.
8. Minister of Education and Culture Regulation No. 70/2009 on Inclusive Education for Learners who have abnormalities and have the potential for intelligence and or special talents
9. SNI 03-7011-2004 Safety in Health Service Facility Buildings
10. SNI 03-1733-2004 Urban Housing Environment Planning Procedure

In addition, the CSRRP project has also developed a Universal Design Audit Checklist to help assess the inclusiveness of buildings, which can be found in the *Residential Universal Design Audit Checklist*, Education Universal Design Audit Checklist, and Health Universal Design Audit Checklist.

## A. Basic Principles and Applications of Universal Design

### 1. Basic Dimensions and Space Requirements

PWOH Regulation No. 14/2017 on building amenity requirements annex 1 section B classifies the basic dimensions into three main parts:

- a. Activity/mobility space for building users and facilities
- b. Design and dimensions of utilities/tools
- c. Circulation dimension

Permen PWOH no 14 of 2017 states that the required circulation space allocation specified for buildings and the environment is at least 30% of the total user and tool space requirements, as determined by the function and classification of the building.

### 2. Guiding Principles

The guiding principles of universal design in building design are in accordance with Permen PWOH No. 14 of 2017 concerning building requirements and facilities Chapter 2 article 5 outlines the basic principles of universal design in building and site design. The regulation identifies 7 points outlined in appendix 1 part A, the regulation, among others:

- a. **Equal use of space;** the design of buildings and the environment must be used by every user without discrimination.
- b. **Safety and security for all;** building and environmental design should minimize hazards and adverse consequences for everyone.
- c. **Ease of access without barriers;** the design of buildings and the environment must ensure easy access to, from, and within buildings that are *barrier-free*, both physically and non-physically, and easy to understand regardless of the level of experience, knowledge, language skills, or concentration level of users.
- d. **Easy access to information;** the design of buildings and environments must ensure easy access to communicative information for all, regardless of the condition and sensory capabilities of the users.
- e. **Independence of space use;** the design of buildings and the environment should

consider users' diverse abilities so that they can be used independently.

- f. **Efficiency of user effort**; the design of buildings and the environment must be able to be used efficiently and comfortably with minimal effort from its users.
- g. **Ergonomic fit of size and space**; the right size and space is provided to be reached and used, regardless of the user's body position, size, posture or mobility.

In the reconstruction and rehabilitation or retrofitting process, it is not always possible to design spaces by strictly adhering to accessibility standards and dimensions. To accommodate these circumstances, Permen PWOH No. 14 of 2017 in appendix 1 part B states: "If the condition of the building cannot meet the basic size of an adequate space, the construction planning can make adjustments as long as the universal design principles are met, and get approval from the TPA and local government".

The implementation of the main principles in universal design will be detailed and realized in technical planning that covers not only the design of the main building but also the supporting facilities related to providing access for all users.

## **B. Universal Design Within the Scope of Area Design**

### **1. Safety and security**

Strategies for implementing universal design at the scale of area design include:

- a. Urban scale, among others:
  - Compact block design for easy access
  - Ease of transportation accommodation
- b. Environmental scale, among others:
  - Roads and public facilities are equipped with adequate lighting
  - Road view is not disturbed by the building
- c. The scale of the building, among others:
  - Accessible public toilets for the disabled and elderly
  - Provision of public changing rooms and baby care facilities

### **2. Distance to public facilities and transportation**

The distance between residential areas and public facilities is important in making neighborhoods universally accessible at the neighborhood - urban level.

Distance-related considerations may be included:

- Block design that minimizes pedestrian distance to access transportation facilities
- Integrate green and social spaces with pedestrian access
- Easily accessible public transportation

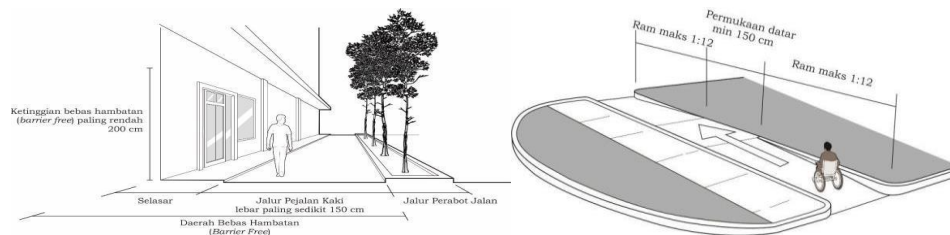
### **3. Building layout**

Building layout that does not interfere with road visibility for road users

## C. Universal design within the scope of street and pedestrian design

### 1. Sidewalk Design

Universal design requirements for pedestrian paths can be seen in Permen PWOH No. 14 of 2017 attachment 2 page 16-25 in this regulation contains universal design for pedestrians including technical requirements, width of pedestrian paths, infrastructure and supporting facilities.



Source: PWOH Regulation No. 14 of 2017 appendix 2

**Figure 4. Universal Design Recommendations on Sidewalks**

### 2. Streetscape and Lighting

Landscaping and lighting serve to improve universal accessibility. Zones for the placement of lighting and road landscaping are regulated in Permen PWOH No. 14 of 2017 appendix 2, item 4. Specifications for lighting and road facilities are regulated in Permen PWOH No. 14 of 2017 appendix 3, item 9.a.3.

### 3. Directional Signs

In terms of universal design, the provision of clear and informative guidance and signs can potentially alleviate the disorientation of people with dementia and autism and can generally improve safety and security for pedestrians. Requirements for directional signs can be found in the Minister of Public Works and Public Housing Regulation No. 14 of 2017 appendix 3, point 13.

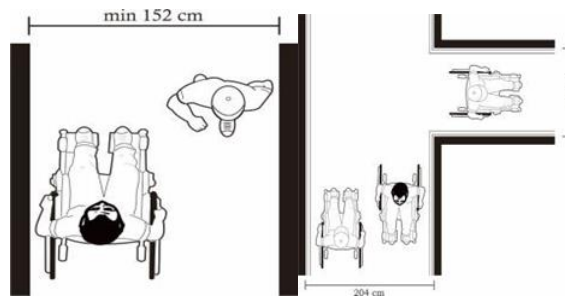
### 4. Vehicle Parking

Providing on-street parking spaces that are easily accessible and safe for persons with disabilities is regulated in PWOH Regulation No. 14/2017 annex 3, item 15.

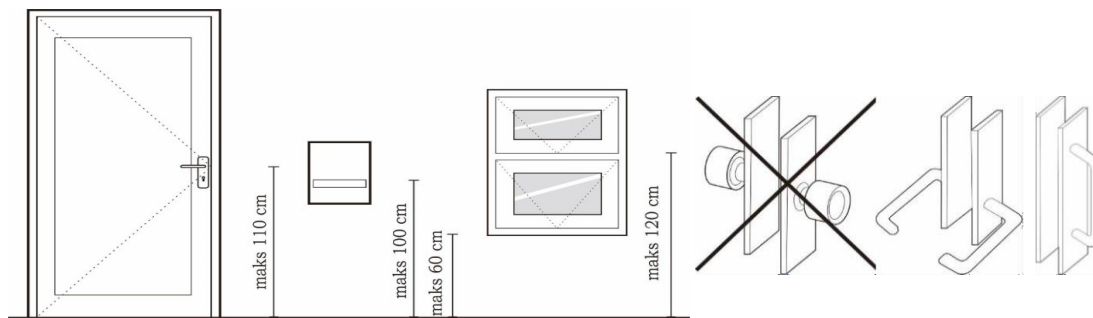
## D. Universal Design Within the Scope of Building Design and Access Circulation

### 1. Access Circulation

Permen PWOH No. 14/2017 in appendix 2 discusses in full about the application of universal design for building circulation including corridors, stairs, *ramps* and access accessories such as doors, windows and other complementary features.

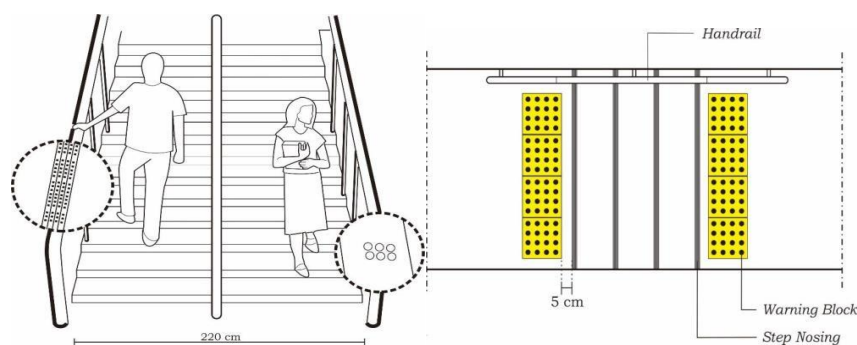


Source: Minister of PWOH Regulation No. 14 Year 2017 in appendix 2  
**Figure 5. Universal Design Recommendations for Circulation in Buildings**



Source: Permen PWOH No. 14 Year 2017 in attachment 2 point B

**Figure 6. Universal Design Recommendations on Door and Window Access Control Heights**



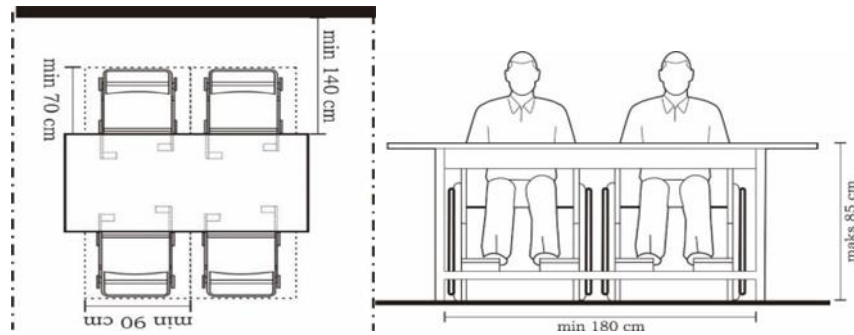
Source: Permen PWOH No. 14 Year 2017 in attachment 2 point A

**Figure 7. Universal Design Recommendations for Stairs**



## 2. Furniture, Fixture and Equipment in Buildings

Universal design principles for FF&E can be seen in PWOH Regulation No. 14/2017 Appendix III point 12.

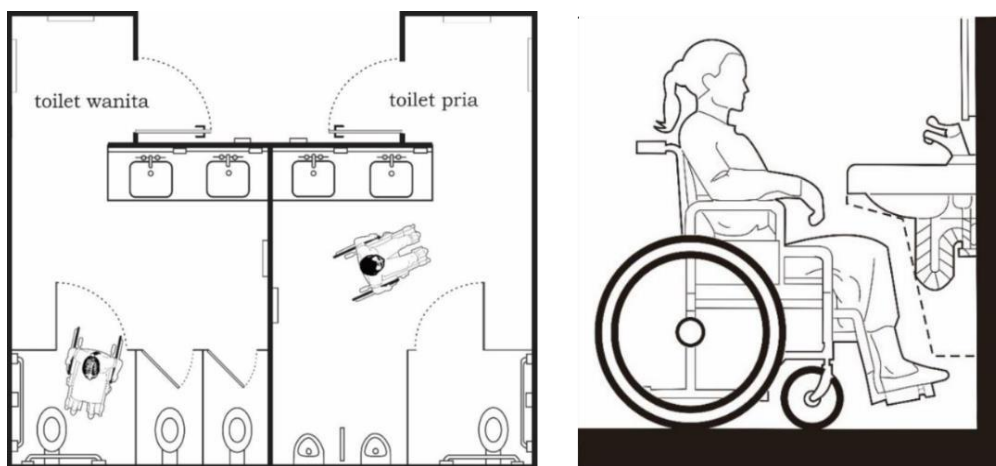


Source: Minister of PWOH Regulation No. 14 Year 2017 in attachment 3 point 12

**Figure 8. Universal Design Recommendations on Furniture**

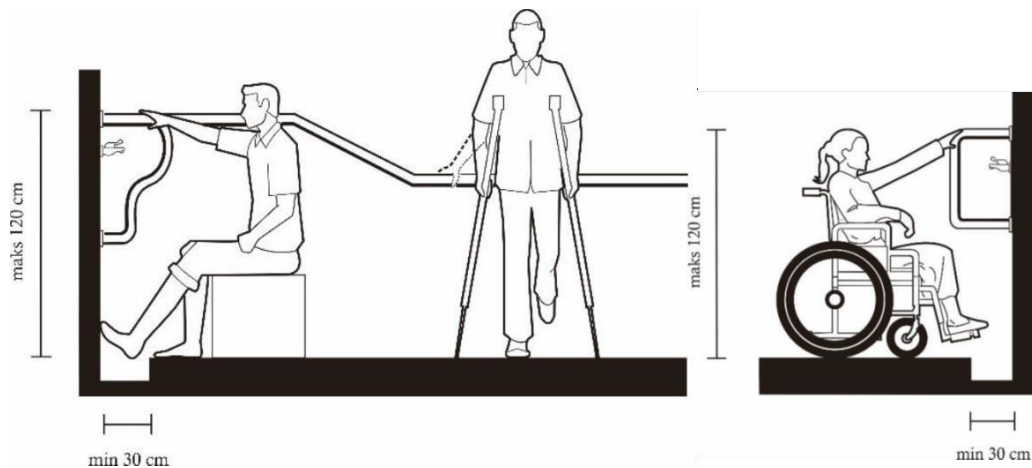
## 3. Restrooms and Showers

Universal design principles in toilets and bathrooms can be seen in Permen PWOH No. 14 of 2017 Appendix 3 point 5. Since the majority of Indonesia's population is Muslim, the availability of ablution rooms in buildings will be better by applying universal design principles by referring to Permen PWOH No. 14 of 2017 Appendix 3 point 3.



Source: Minister of PWOH Regulation No. 14 Year 2017 in attachment 3 point 5

**Figure 9. Universal Design Recommendations for Public Restrooms**



Source: Minister of PWOH Regulation No. 14 Year 2017 in attachment 3 point 3

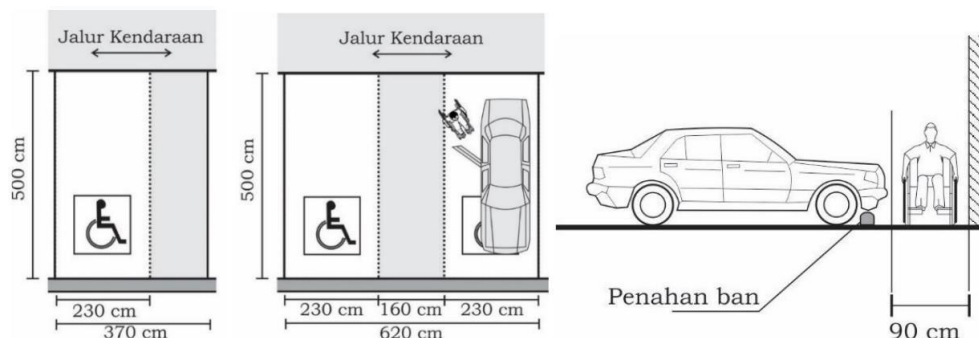
**Figure 10. Universal Design Recommendation - Handrails Available Adequate**

#### 4. Directional Markers and identification signs in Buildings

Room identification signs in the building and direction markers can provide information to users about the location of important facilities and infrastructure, for this reason the application of universal design in direction markers and identification signs can be seen in PWOH Regulation No. 14 of 2017 Appendix III item A.13.

#### 5. Off-street Parking

The universal design principle for off-street parking can be seen in PWOH Regulation No. 14/2017 Appendix III point 15.



Source: PWOH Regulation No. 14 Year 2017 in attachment 3 point 15

**Figure 11. Universal Design Recommendation - Off-Street Parking**

### E. Universal Design in Housing and Residential Environments

#### 1. Access Circulation

Universal design principles for access circulation in dwellings can be seen in PWOH Regulation No. 14 Year 2017 Appendix II point A and Appendix III point 13)

## 2. General Interior Design

The universal design principle for interiors in dwellings is that the furniture dimensions must consider the ease of access to occupant circulation in the dwelling.

## 3. Kitchen and Bedroom

The application of universal design for the kitchen room can be seen in PWOH Regulation No. 14 Year 2017 Appendix 1 point B, Appendix III point 12, while the application of universal design for the bedroom can be seen in PWOH Regulation No. 14 Year 2017 Appendix I point B and Appendix III point 12).

# **F. Universal design within the scope of educational facilities**

## 1. General Design

The application of accessibility that prioritizes universal design must consider the needs of students, teachers and people with disabilities, guidelines for applying universal design to the design of educational facilities can be seen in:

- PWOH Regulation 14 Year 2017 Appendix 3 item A,
- Regulation of the Minister of Education and Culture No. 33 Year 2008
- SNI 03-1733-2004 on procedures for planning residential and urban environments - table 8

## 2. Classroom Design

A square-shaped classroom design is recommended for a more flexible classroom layout for wheelchair access and maneuvering. The application of universal design in classroom design can be seen in the Minister of Education and Culture Regulation No. 33 Year 2008, Appendix part C point 6 and part D point 1.

## 3. Common and Play Areas

Public and play areas must be accessible to students with disabilities. The application of universal design in access to public and play areas can be seen in the Minister of Education and Culture Regulation No. 33 of 2008 Appendix part D point 3, Permen PWOH No. 14 of 2017 Appendix II point A.

## 4. Library and Laboratory

Universally accessible schools should consider the accessibility of these spaces for all students and teachers. The application of universal design can be seen in the Regulation of the Minister of Education and Culture No 33 of 2008 Appendix part D items 1.2 and 2.

# **G. Universal Design in Health Facility Building Scope**

## 1. General Design

Accessibility in health facility buildings plays an important role in ensuring that health and medical services are easily accessible to all community members, including people with disabilities and those in special circumstances. The application of universal design for health facility buildings refers to:

- PWOH Regulation No. 14 Year 2017
- SNI 03-1733-2004 on urban residential environment planning procedures

- Permenkes No. 24 of 2016 concerning technical requirements for hospital buildings and infrastructure
- 2. Emergency Room Access  
The emergency room requires direct circulation, unimpeded access paths, universal design principles applied refer to Permenkes No. 24 of 2016 Appendix part G point 3
- 3. Medical and Non-Medical Support Units  
The principle of accessibility with universal design refers to Permen PWOH No. 14 Year 2017, Appendix III, Point 12, SNI 03-7011-2004 concerning safety in Health Service Facility Buildings and Permenkes No. 24 Year 2016.
- 4. Inpatient and Outpatient  
Universal design principles for inpatient and outpatient care refer to Permenkes No. 24 year 2016 Appendix part G item 1 and item 2, Appendix F item 3)

#### **2.8.4 Earthquake Resistant Buildings**

The implementation of earthquake-resistant infrastructure must be integrated and sustainable, so it is necessary to change the paradigm from just building to building safer and better to increase the resilience of building structures and reduce the risk of vulnerability to disasters. Aspects of earthquake-resistant design provisions in Indonesia refer to the National Standardization Agency Earthquake Planning Procedures, namely:

1. SNI 1726:2019 on Earthquake Resistance Planning Procedures for Building and Non-Building Structures.
2. SNI 8899:2020 on Procedures for Selection and Modification of Surface Ground Motion for Earthquake Resistant Building Planning.
3. SNI 8460:2017 on Geotechnical Design Requirements, as a reference for designing foundations.
4. SNI 2847:2019 on Structural Concrete Requirements for Building as an update of SNI 2847:2013.
5. SNI 1727: 2020 on Minimum Design Loads and related Criteria for Buildings and Other Structures, as an update to SNI 1727:2018.
6. SNI 7972:2020 on Prequalified Connections for Special and Intermediate Moment Trusses of Steel in seismic applications.
7. SNI 7860:2020 on Seismic provisions for Structural Steel Buildings.
8. Minister of Public Works Regulation No. 16/M/2010 on technical guidelines for periodic building inspection
9. Minister of Public Works Regulation No. 26/PRT/M/2008 on Technical Requirements for Fire Protection Systems in Buildings and the Environment
10. Circular Letter No. 47/SE/DC/2020 on Technical Guidelines for Standardizing the Design

and Assessment of School and Madrasah Damages.

#### 11. Technical Guidance on Seismic Strengthening Options for Education and Health Buildings in Central Sulawesi recovery activities

In the application of earthquake-resistant buildings, there are 4 levels in building retrofitting measures, namely rehabilitation, partial retrofitting, full retrofitting at the life safety performance level, and full retrofitting at the direct occupancy performance level, with each main objective shown in the following table.

**Table 11. Building Reinforcement Levels**

Level	Action	Key Objectives
1	<b>Rehabilitation</b>	Improved appearance without structural considerations
2	<b>Partial reinforcement</b>	Reinforcement of some structural elements that are considered critical to avoid collapse during an earthquake.
3	<b>Full reinforcement of life safety performance level</b>	Retrofitting of structural systems that still allow repair after an earthquake without being demolished
4	<b>Full retrofitting of immediate occupancy performance level</b>	Strengthening of structural systems that allow buildings to be occupied immediately after an earthquake

The following are the implications and some recommendations for structural adjustments related to RISHA building design by SNI 1726-2019.

**Table 12. Implication of SNI 1726-2019 to RISHA Design**

Factor	SNI 03-1726-2002	SNI 1726:2019	Implications
<b>Primacy Factor</b>	1	1,5	Increased design seismic load
<b>MRI Earthquake Design</b>	475 years	2,475 years	Increased design seismic load
<b>Structure System</b>	No restrictions	Concrete moment frame connections can develop capacity and stiffness equivalent to monolithic cast connections	The RISHA connection system must be customized to achieve the performance required by SNI 1726-2019.

**Table 13. Recommended Adjustments to RISHA Structure Design**

SNI 1726:2019 Table 12	Recommendation Options	Implications
B.4	Frame system with special reinforced concrete shear walls	<ul style="list-style-type: none"> <li>- <i>In-situ</i> reinforced concrete shear walls molded inside the RISHA frame, allowing connection to the RISHA modules</li> <li>- The RISHA module will only be used</li> </ul>

SNI 1726:2019 Table 12	Recommendation Options	Implications
		<p>as a vertical load-bearing system, taking into account the forces generated due to seismic deformation.</p> <ul style="list-style-type: none"> <li>- The RISHA roof beam ring will serve as a collector element. Modules and connections will be designed as required.</li> <li>- The foundation must be redesigned for the forces acting under the shear wall.</li> </ul>
B.8	Frame system with intermediate precast shear walls	<ul style="list-style-type: none"> <li>- Prefabricated applicators can make prefabricated molds for shear wall modules to match the RISHA frame and meet the requirements of SNI 1726:2019.</li> </ul>

The above table recommendations are only considered for newly constructed single-story school buildings with the RISHA system.

**Table 14. RISHA Structure Design Reference**

Steps	Reference	Note
Establishment of ZRB locations on the Disaster Map in Palu	PASIGALA disaster-prone space zoning map	To determine the potential for liquefaction or earthquake
Determination of building utilization allowed on the site	<ul style="list-style-type: none"> <li>- Map of disaster-prone spatial zones of Palu and its surroundings (ZRB Map)</li> <li>- Building Approval (PBG)</li> <li>- Certificate of Good Function (SLF)</li> </ul>	To determine whether a constructed project is permitted within the site considering the risk of liquefaction
Geoengineering assessment and recommendations	Geotechnical Assessment concerning SNI 8460:2017	If the proposed development has a higher risk category than that permitted in the ZRB map, where a geotechnical assessment is required to determine whether the development will be permitted on the site
RISHA system suitability	RISHA handbook published by PWOH	Consider: <ul style="list-style-type: none"> <li>- Briefing to contractors</li> <li>- Architectural requirements</li> </ul>
Consult the RISHA handbook	SNI 1726:2019	Design according to SNI 1726:2019 Considering: <ul style="list-style-type: none"> <li>- 3m x 3m column plan</li> <li>- Minimum material requirements</li> <li>- Special attention should be</li> </ul>

Steps	Reference	Note
		paid to the details of the connection between beams and columns, the connection of beam modules at mid-span, and the connection of column modules at mid-height.
Structural analysis and design	<ul style="list-style-type: none"> <li>- RISHA Pocket Guide</li> <li>- SNI 1726:2019: Earthquake Resistance Planning Procedures for Building and Non-Building Structures</li> <li>- SNI 1727:2020: Minimum Design Loads and Related Criteria for Buildings and Other Structures</li> <li>- SNI 2847:2019: Structural Concrete Requirements for Buildings</li> </ul>	<ul style="list-style-type: none"> <li>- Apply structural loading based on SNI</li> <li>- Design of reinforced concrete elements according to SNI 1726: 2019 and SNI 2847:2019</li> </ul>
Design, Development and Detailing of RISHA Elements to the standards set out in the handbook	RISHA Pocket Guide	
Creation of construction documents that meet the standards and quality assurance requirements in the RISHA pocket book	RISHA Pocket Guide	

### 2.8.5 Sustainable Building (Green Building)

Green buildings are buildings that in their construction design or operation reduce or eliminate negative impacts. They can create a positive impact on the climate and improve the quality of life. Any building can be a green building, home, office, school, hospital, community center, or any other type of structure.

There are three green building regulations in Indonesia:

1. Permendagri 8/2010 on criteria and certification of green buildings;
2. Minister of Public Works and Housing Regulation 02/PRT/M/2015 on Green Building;
3. DKI Jakarta Governor Decree 38/2012 on Green Building;

In addition, the ESD Guidelines for Rehabilitation and Reconstruction of Public Facilities in Central Sulawesi can also be used as an enrichment. Green building principles that can be applied in the design of CSRRP activities include:

- Reduction of both physical and non-physical waste generation;



- Use of environmentally friendly construction materials;
- *Reuse* of construction materials that can be reused;
- Use of *recycled* material sources;
- Environmental protection and management;
- Energy-saving, water-saving design;
- Green open space optimization;
- Independent waste management.

### 2.8.6 Water Sensitive Urban Design

**Definition, Principles and Objectives of WSUD.** WSUD is a land planning and design engineering approach that integrates the urban water cycle, including stormwater, groundwater, wastewater management and clean water, into the design of an urban area to minimize environmental damage and enhance aesthetic and recreational appeal. WSUD is a term used in Australia and has similarities with *low-impact development* (LID), used in the United States; and sustainable urban drainage systems (SUDS), used in the United Kingdom. (*Evaluating Options for Water Sensitive Urban Design - An National Guide*)

The principles in WSUD according to Australia's national guidelines on WSUD are:

1. Protect and enhance (strengthen) rivers, streams and wetlands in an urban environment
2. Protect and improve the quality of water flowing from urban neighborhoods into small rivers, larger streams, and wetlands.
3. Restoring the urban water environment by maximizing the reuse of rainwater, recycled water, and *greywater*
4. Protect (conserve) water resources through reuse by recycling and system efficiency
5. Integrate stormwater management into the landscape so that it offers multiple beneficial uses such as water quality treatment, natural habitat, recreation and public open space.
6. Reduce peak flows and water runoff from the urban environment and simultaneously provide infiltration (the flow of water into the ground through the ground's surface) and *groundwater recharge*.
7. Integrating water into the landscape to enhance urban design and social, visual, cultural and ecological values: and
8. Easy implementation and cost-effective utilization allow for widespread application and deployment.

The objectives of WSUD are:

1. Regulate water balance (groundwater, stream flow, and damage by floodwater and erosion.
2. Maintaining and where possible improving water quality (including sediment, protection of riparian vegetation and minimizing the transfer of pollutants to surface and groundwater)
3. Encouraging water conservation (minimizing imports of potable water supplies through rainwater harvesting and wastewater recycling and reducing irrigation requirements) and

maintaining water-related environments and recreational opportunities. (Whelanz 1994)

## WSUD Technical Elements

The following are some of the methods for sustainable water management. These methods are grouped based on some of their primary functions, namely:

1. Rainwater Usage/Harvesting
2. Rainwater Handling
3. Detention and Infiltration
4. Transportation, and
5. Evapotranspiration

(*Water Sensitive Urban Design Principles and Inspiration for Sustainable Stormwater Management in the City of the Future Manual*, 2011)

### Design of Technical Elements according to *Water Sensitive Urban Design for Western Sydney*

The planning process uses the technical elements that occur in the *Guideline Water Sensitive Urban Design for Western Sydney* as one of the references in providing recommendations that various other sources will support. These elements include Vegetated Swales, *Vegetated Filter Strips / Buffer Strips*, Sand Filters, Bioretention Systems, *Permeable Pavements*, Infiltration Trenches, Infiltration Basins, and Rainwater Collection Tanks.

## WSUD Guidelines for Housing and Industrial/Commercial Areas

The WSUD guidelines for housing are divided into four sections:

1. Public Open Space Network
2. Housing Layout
3. Road Layout
4. Streetscape Layout

**Table 15. Suggested Land Use**

Component	Parameters
Public Open Space Network	<ol style="list-style-type: none"> <li>1. <i>Buffer Strip</i>: Combines buffer strips and grass swales so that residents can walk around existing natural water features.</li> <li>2. Filtration/Retention ponds: Integrate filtration/retention with public open spaces</li> <li>3. Public Open Space Network: Combining public open spaces with nodes where people are active</li> <li>4. Drainage Corridors: Use drainage corridors to direct runoff water to nearby ponds.</li> <li>5. Natural Drainage: Maintaining natural drainage</li> </ol>
Housing Layout	<ol style="list-style-type: none"> <li>1. Increase Public Open Space: Encourage a reduction in private open spaces and an increase in public open spaces, especially in areas adjacent to existing public open spaces.</li> <li>2. <i>Setbacks</i>: <i>Setbacks</i> (distance between buildings and roads, rivers, etc.) according to topography, drainage characteristics, vegetation, and visual quality.</li> <li>3. <i>Buffer zones</i>: Integrate buffer zones with existing rivers and maintain existing</li> </ol>

Component	Parameters
	<p>vegetation.</p> <ol style="list-style-type: none"> <li>Orientation: Oriented towards housing and public open spaces</li> <li>Reduce <i>paving</i> or pavement</li> <li>Residential runoff water: Residential runoff water should be directed to the treatment area as much as possible.</li> </ol>
Road Layout	<ol style="list-style-type: none"> <li>Road Alignment: Ensure that local collector roads are aligned with contours</li> <li>Access: Ensure access points are close and access roads are perpendicular to the contours. Design the access to the site as a direct road to the local runoff collection/containment area.</li> <li>Reduced impervious surface</li> <li>Roadside Detention:</li> <li>Road Location: Place public open space at the end of local collector roads (place on cul-de-sacs) to capture local water runoff.</li> <li>Small and Large Intensity Runoff:</li> <li>Incorporate swales to convey runoff water on collector roads, while larger roads carry large volumes of runoff water.</li> </ol>
Streetscape Layout	<ol style="list-style-type: none"> <li>Reduce pavement area by: <ol style="list-style-type: none"> <li>Reduced pavement area width</li> <li>Using <i>stalls</i> in parking lots with smaller sizes</li> <li>Incorporate a walkway on one side of the road only;</li> <li>Using a shared driveway</li> </ol> </li> <li>Local Filtration and Detention: Use local storm drains, filtration ditches and pits to retain and filter runoff water during peak storm events. Use of cul-de-sacs for local retention ponds and use of limited access collector roads for swales. Incorporate techniques such as infiltration ponds and porous pavement.</li> <li>Underground Services: Integrating underground power and telecommunication services to enhance landscaping options.</li> <li><i>Setbacks</i>: Incorporate variable building setbacks to improve landscaping, roadway, and drainage design options. Determine setbacks according to pavement widths, services, and landscaping needs.</li> <li>Landscaping: Using landscaping to foster interest and variety in the streetscape</li> <li><i>Crossover</i>: Integrate <i>crossover</i> design <i>with</i> vegetative swales and local retaining basins</li> <li>Recycle runoff water: Using runoff water for irrigation of local vegetation.</li> </ol>
Parking Area	<ol style="list-style-type: none"> <li>Porous Pavement: "overflow" from underutilized parking areas can be handled by constructing porous pavement.</li> <li>Detention and Storage in Car Parking Lots: Incorporate a grassy sloping topography and hidden depressions into the parking lot design to support detention and treatment of runoff water.</li> <li>Infiltration: using trenches for infiltration to minimize runoff water.</li> <li>Maintain natural drainage pathways</li> <li>Landscape: incorporate vegetation to improve comfort and water usage.</li> </ol>

Source: Urban Stormwater Best Practice Environmental Management Guidelines. CSIRO 1999.

For the 5 implementation principles above, data will be obtained through primary surveys, including in-depth interviews, observations and FGDs as well as secondary data both KPI achievement data, MIS and other supporting documents.



## CHAPTER 3 METHODOLOGY

### 3.1. Final Evaluation Activity Timeframe

The ESC assignment, per the contract number HK.02.03/ESC/IBRD-CSRRP/SATKER-PKP/06/2023 dated November 13, 2023, was carried out from November to June 2024. In its overall implementation, the project experienced delays from the time that should have been completed in June 2024, then based on the approval of the extension of the loan Letter No. CD-122/WB/VI/2024 dated June 20, 2024, the CSRRP activities were extended until December 31, 2024. At the same time, the ESC Contract was extended until October 2024.

In relation to that, where the progress of activities in the field is delayed, the ESC survey activities can only be carried out starting September 2024, with cut off data on August 31, 2024, assuming that the occupancy process has met a minimum of 50% of the total PAPs in each shelter.

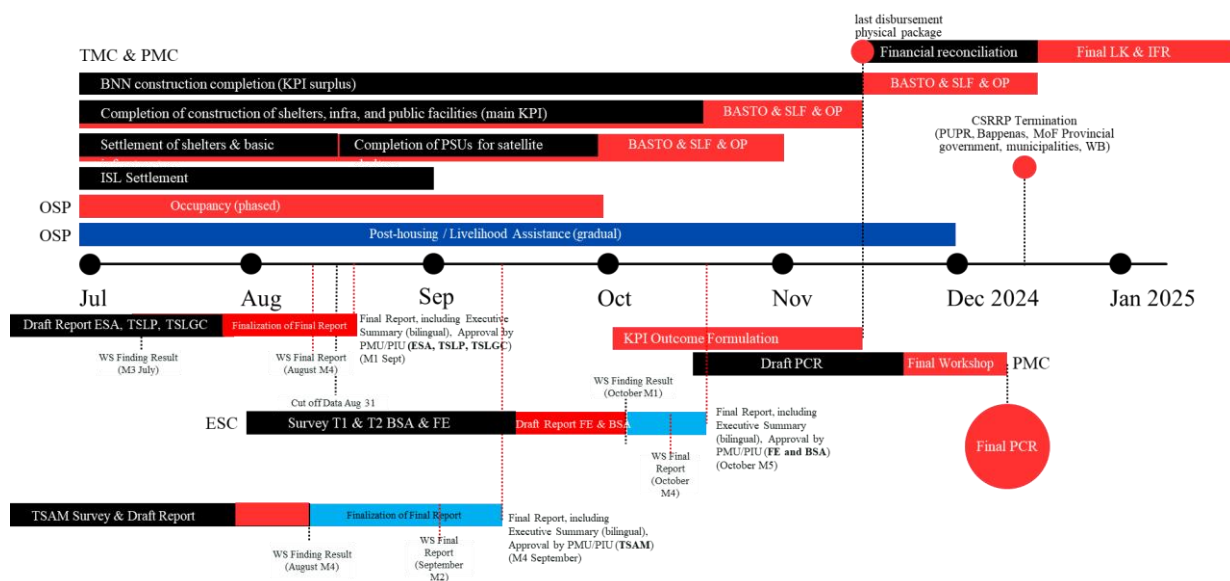


Figure 12. Timeframe of Final Evaluation activities

### 3.2. Program Condition at Final Evaluation

In general, the final evaluation of a project is done after the project is completed, thus describing the real achievement of the project against the set targets.

The ESC's assignment in the Final evaluation, faced with the real condition that not all CSRRP activities have been completed, at the time this report was compiled, several things should be noted:

1. The overall physical progress of CSRRP activities from the total with physical progress is

94.51% while the financial progress is 91.66%.

2. **For component 1:** out of a total of 26 packages, 20 packages were declared complete. The physical progress is around 97.69% and the financial progress is around 93.74%, with details as follows:
  - a. **Huntap package:**
    - 1) Of the total 9 packages, 7 packages were declared complete with an overall physical progress of around 98.35% while finance was around 96.11%, the unfinished packages were 2 packages, namely packages IIB and IIF.
    - 2) The number of shelters built is 3,852 (99%) of the target of 3880, while those who have handed over the keys are 3,301 (85%), which have not yet completed their occupancy, among others in the Tondo 2, Talise, Bangga Satellite hamlets 1,2 and 3.
  - b. **Settlement infra packages;** out of a total of 17 packages, 13 packages were declared complete with an overall physical progress of 97.04% and financial progress of 91.38%, which have not been declared complete, namely for the package:
    - 1) Construction of Settlement Infrastructure Tondo 2 Area, Palu City
    - 2) Construction of Water Treatment Plant 2x30 L/s for Huntap Tondo 1, Tondo 2 & Talise, Palu City
    - 3) Construction of Water Distribution Pipe and House Connection in Palu City
    - 4) Construction of Water Distribution Pipe and House Connection in Sigi Regency
3. **For Component 2 Public Facilities** out of a total of 14 packages, 9 packages were declared complete with physical progress of 93.31% and finance of 87.58%, of which 5 packages have not been declared complete, namely:
  - a. Rehabilitation Package of Hospital of Undata Phase II-B,
  - b. Reconstruction of Office Building of National Narcotics Agency of Central Sulawesi Province,
  - c. Rehabilitation and Reconstruction of Education Facilities in Tadulako University Phase II,
  - d. Rehabilitation and Reconstruction of Elementary Education Facilities II-A,
  - e. Rehabilitation and Reconstruction of Elementary Education Facilities Phase II-B

### 3.3. Evaluation Framework

In accordance with the TOR, the framework for the final evaluation generally refers to 7 key questions. From the 7 key questions, key variables were developed that formed the basis of the survey design.

The methods and processes to be carried out include:

1. **Sample frame and size;** formulated by the reference in the TOR at 95% Confidence level with a maximum confidence level of 5%,
2. **Data collection methods, carried out by:**
  - a. **Primary Data:**

- 1) Beneficiary Survey
  - 2) Infrastructure Quality Observation
  - 3) Indepth Interview
- b. **Secondary Data:**
- 1) BPS Data
  - 2) Contract Data
  - 3) PMC, TMC1&2 data
  - 4) Study Result Data TSLP, ESA, TSAM, TSLGC
  - 5) Other data as needed
3. **Methods of Analysis:** In order to obtain the desired results, several methods were used, including:
- a. **Descriptive statistical analysis;** Descriptive statistics is the activity of collecting, organizing, summarizing and presenting data with the hope that the data is more meaningful, easy to read and easy to understand by data users, carried out on most of the survey data, both beneficiary surveys and observations of infrastructure activities.
  - b. **Cost Benefit Analysis (CBA):** A method for calculating the (monetary) value of benefits from a project, in CSRRP in relation to the benefits of shelter and settlement infrastructure and rehabilitation and reconstruction of public facilities.
  - c. **Economic Analysis;** Conducted to calculate the efficiency and benefits of the project with NPV, B/C ratio and EIRR benchmarks.
4. **Expected outcome;** a final report describing the answers to all key questions.

It is summarized in the following graph:

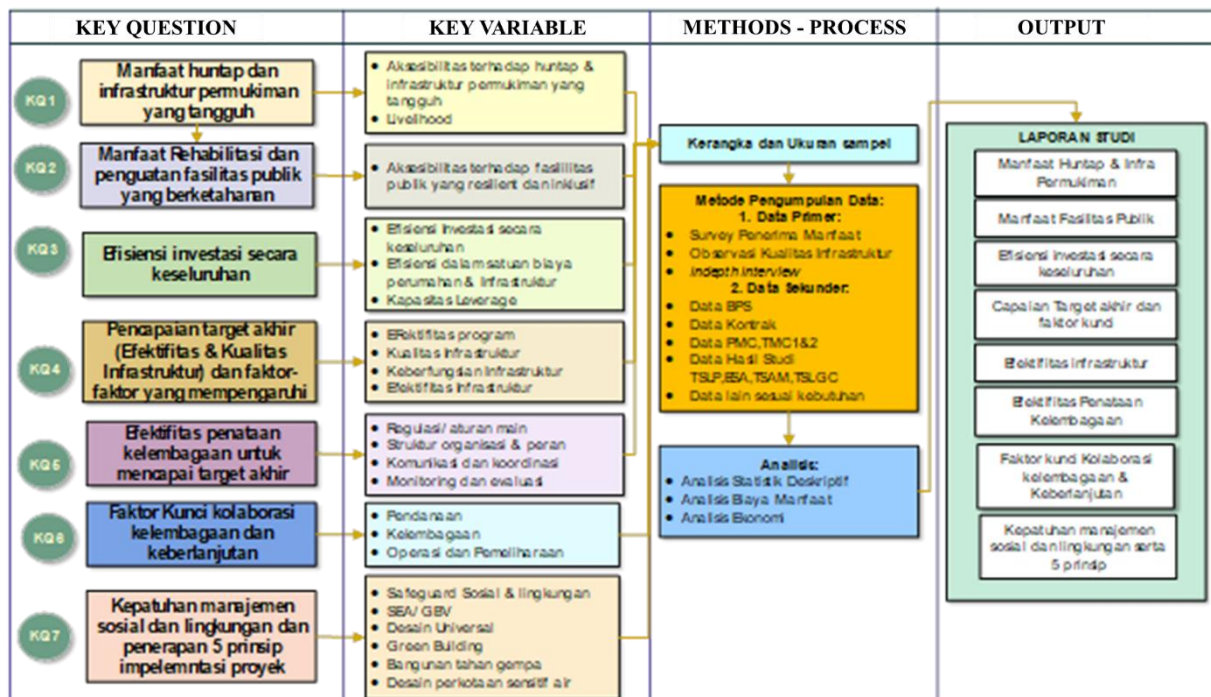


Figure 13. Evaluation Framework



### 3.4. Framework and Sample Size

#### 3.4.1. Sample Method

The sampling method used is **Stratified Random Sampling**, where the population is divided into several strata before random sample selection. In the permanent housing development project, the population is divided into two strata based on the proportion of target types of housing, namely:

1. **Huntap Kawasan** which covers about 60% of the target population,
2. **Satellite and Independent shelters** that cover about 40% of the target population.

After dividing the strata, a sample from each stratum was randomly selected, according to the number of permanent housing targets in each category.

Meanwhile, for **Public Facilities**, the population was divided into three strata based on the type of facility built, namely:

1. **Educational facilities** (schools and other educational facilities),
2. **Health facilities** (hospitals, health centers, or clinics),
3. **Other Public Facilities** (such as government buildings and other public facilities).

Each stratum was represented by at least one type of development activity, and a sample from each stratum was randomly selected to ensure adequate representation of each constructed facility category.

#### 3.4.2. Target Population

The **target population** for the CSRRP Evaluation survey is divided into 2 target populations:

1. **Beneficiaries**
  - All beneficiaries of shelters and settlement infrastructure have 3,880 units and a total beneficiary of around 12,441 people.
  - All beneficiaries of public facilities with a total of 14 packages of 26 entities (final beneficiaries).
2. **Physical output:**
  - All the physical buildings of the shelters and the total number of 3,880 units and infra settlements with a total of about 395 activities.
  - All physical buildings of public facilities with a total of 14 packages of 26 entities (final beneficiaries).

#### 3.4.3. Unit of analysis

The units of analysis in this study are divided into two main categories, namely beneficiaries and physical outputs. The following is a detailed explanation:

1. **Beneficiaries:**
  - **Individuals of disaster-affected people who received permanent housing benefits:** The units of analysis in this category are individuals from disaster-affected communities who receive permanent housing benefits. These residents are

those whose old shelters were damaged by the disaster, so they are the direct beneficiaries of the new shelters built in the rehabilitation and reconstruction project.

- **WB of beneficiaries of public facilities (managers or service recipients):** The unit of analysis for public facilities includes facility managers (such as school principals, hospital directors, or officials managing government facilities) as well as the people who use the services. These are the ultimate beneficiaries of the constructed public facilities, and the analysis will assess the extent to which the facilities benefit the managers and service users in the affected communities.

## 2. Physical Output:

- **Physical buildings for permanent housing and settlement infrastructure:** The unit of analysis in this category includes all physical buildings constructed for permanent housing, as well as supporting infrastructure such as roads, drainage systems, sanitation, and other public facilities. This research will analyze the quality, feasibility and functionality of these infrastructures in supporting the daily lives of disaster-affected residents.
- **Public facilities:** Constructed public facilities, such as school buildings, health facilities (hospitals, clinics), and government buildings are also part of the analysis unit. The evaluation in this unit will focus on the physical condition of the buildings, the quality of construction, and the ability of the facilities to function optimally in serving the affected communities.

### 3.4.4. Sample frame.

#### 1. Beneficiaries:

- **Representative beneficiaries according to the type of shelter and public facilities:** In this sample frame, beneficiaries will be drawn in a representative manner from the different types of permanent housing and public facilities that have been built. These representatives include individuals or groups of disaster-affected people (PAPs) who live in shelters that have handed over the keys, totaling 3,301 units. Meanwhile, public facilities are beneficiaries who utilize public facilities, especially those that have been declared complete, namely around 24 entities, such as schools, hospitals, or government buildings. This selection of representatives is done to ensure that all types of shelters and public facilities are proportionally represented.

#### 2. Physical Output:

- **Representative physical buildings:** The sample frame for physical outputs consists of physical buildings that represent the three main categories of public facilities, i.e. about 26 entities:

- **Health Facilities:** A hospital building, health center, or other health facility constructed under the project.
- **Educational Facilities:** School buildings or other educational facilities that benefit from this project.
- **Other Public Facilities:** Government buildings or other public facilities built to support public services.

### 3.4.5. Confidence Level & Margin of Error

#### 1. Beneficiaries:

- For **permanent housing**, a minimum confidence level of **95%** is desired, with a **maximum margin of error of 5%**. This means that the results of a survey conducted on shelter beneficiaries will have a confidence level of 95%, with a margin of error of no more than 5%.
- For the **ESC quantitative survey**, a confidence level of **95%** is desired, with a **margin of error of 3.7%**. This means that the accuracy of the ESC survey is expected to be higher with a smaller margin of error, except for public facilities that have different conditions.

#### 2. Physical Output:

- For **permanent housing**, a minimum confidence level of **95%** is desired, with a **maximum margin of error of 5%**. This ensures that the survey results related to the physical condition of the shelters are reliable with a 95% confidence level, and the maximum error in the survey results is no more than 5%.
- For the **ESC quantitative survey** on physical outputs, a confidence level of **95%** is desired, with a **margin of error of 4.2%**. This survey targets a smaller margin of error, except for public facilities which have different calculations.

### 3.4.6. Sample Size

#### 3.4.6.1. Huntap Beneficiary Sample

Based on the sample calculation of the population with the Confidence Level and Margin of Error described above, the following sampling method is carried out:

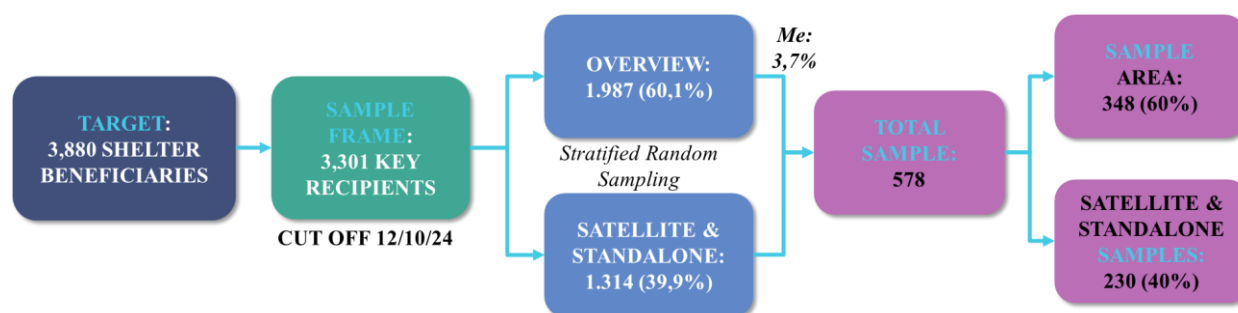


Figure 14. Sampling Method

So then the sample is obtained as follows:

**Table 16. Sample size of Huntap beneficiaries**

No .	FIXED HOUSING	Target		%	Key Handover	Weight	Sample (ME=3,7%)
						%	
1	AREA-SCALE PERMANENT HOUSING	2.309	2.309	59,51%	1.987	60%	348
	a. Tondo 2	961		41,6%	742		130
	b. Talise	693		30,0%	592		104
	c. Petobo	655		28,4%	653		114
2	SATELLITE-SCALE PERMANENT HOUSING	1.308	1.571	40,49%	1054	40%	230
3	SELF-LAND PROVISION PERMANENT HOUSING	263			260		
<b>TOTAL</b>		<b>3.880</b>	<b>2.311</b>		<b>3.301</b>		<b>578</b>

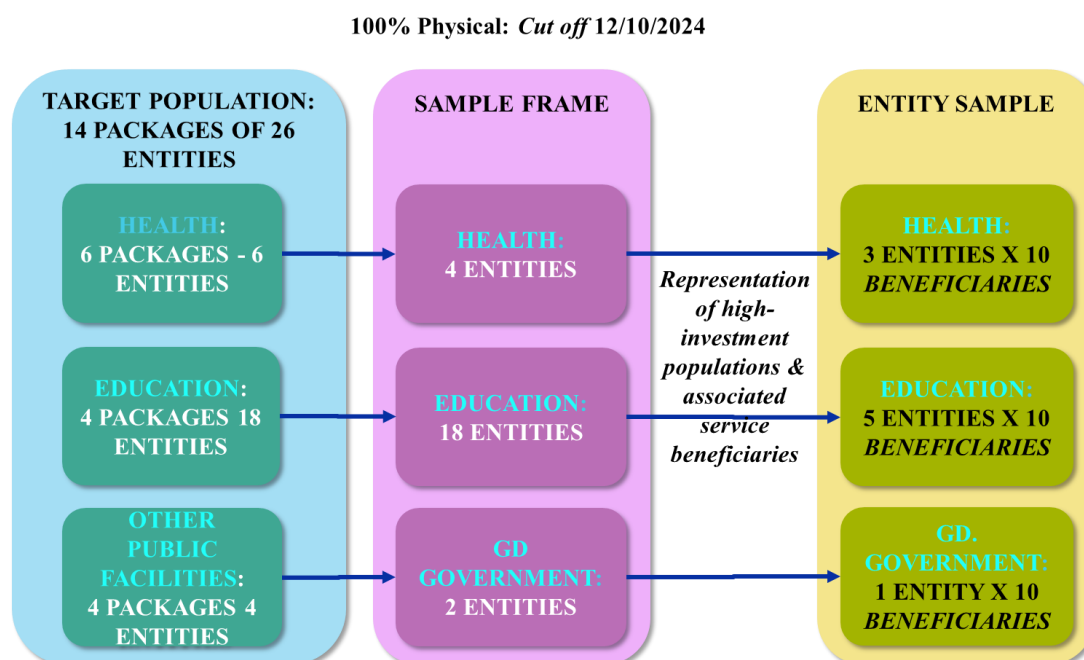
**Table 17. Detailed sample of shelter beneficiaries**

No .	Development Location	Numbe r of Units	Occupancy		Sample
			SK (Occupancy)	Key Handover / Move-in / Occupy	
Area-Scale Permanent Housing					
1	Tondo 2, Palu City	961	961	742	130
2	Talise, Palu City	693	599	592	104
3	Petobo, Palu City	655	655	653	114
	<b>TOTAL</b>	<b>2.309</b>	<b>2.215</b>	<b>1.987</b>	<b>348</b>
Satellite-Scale Permanent Housing					
1	Talise Panau 1, Palu City	27	27	27	2
2	Talise Panau 2, Palu City	26	26	26	2
3	Ganti, Donggala district	17	17	17	5
4	Lende, Donggala district	68	68	68	13
5	Lende Ntovea 1, Donggala district	30	30	30	7
6	Lende Ntovea 2, Donggala District	44	44	44	12
7	Loli Dondo, Donggala district	16	16	16	4
8	Loli Channel, Donggala District	18	18	18	4
9	Loli Tasiburi III, Donggala Regency	17	17	17	4
10	Lompio, Donggala district	18	18	18	5
11	Wani Satu, Donggala Regency	73	73	73	18
12	Tompe 1, Donggala district	44	44	44	10

No .	Development Location	Number of Units	Occupancy		Sample
			SK (Occupancy)	Key Handover / Move-in / Occupy	
13	Tompe 2, Donggala district	83	83	83	19
14	Tompe 3, Donggala district	161	161	161	28
15	Tanjung Padang, Donggala Regency	13	13	13	2
16	Ujumbou, Donggala Regency	46	46	46	-
17	Tondo, Donggala district	35	35	35	-
18	Bangga Hamlet 1 & 3, Sigi Regency	51	51	47	-
19	Bangga Dusun 2, Sigi District	146	146	50	-
20	South Sibalaya, Sigi District	118	118	118	30
21	North Sibalaya, Sigi District	64	64	64	-
22	Poi, Sigi district	25	25	25	-
23	Rogo, Sigi district	14	14	14	-
	<b>TOTAL</b>	<b>1.154</b>	<b>1.154</b>	<b>1.054</b>	<b>165</b>
<b>Self-Land Provision Permanent Housing</b>					
1	Mandiri, Palu City	263	263	260	65
	<b>TOTAL</b>	<b>263</b>	<b>263</b>	<b>260</b>	<b>65</b>
	<b>TOTAL HUNT</b>	<b>3.726</b>	<b>3.632</b>	<b>3.301</b>	<b>578</b>

### 3.4.6.2. Sample of Public Facility Beneficiaries

For beneficiaries of public facilities, since the margin of error was not determined, the sampling method was as follows:



**Figure 15. Sampling Method for Beneficiaries of Public Facilities**

The sample details for public facilities are as follows:

**Table 18. Sample of Beneficiaries of Public Facilities**

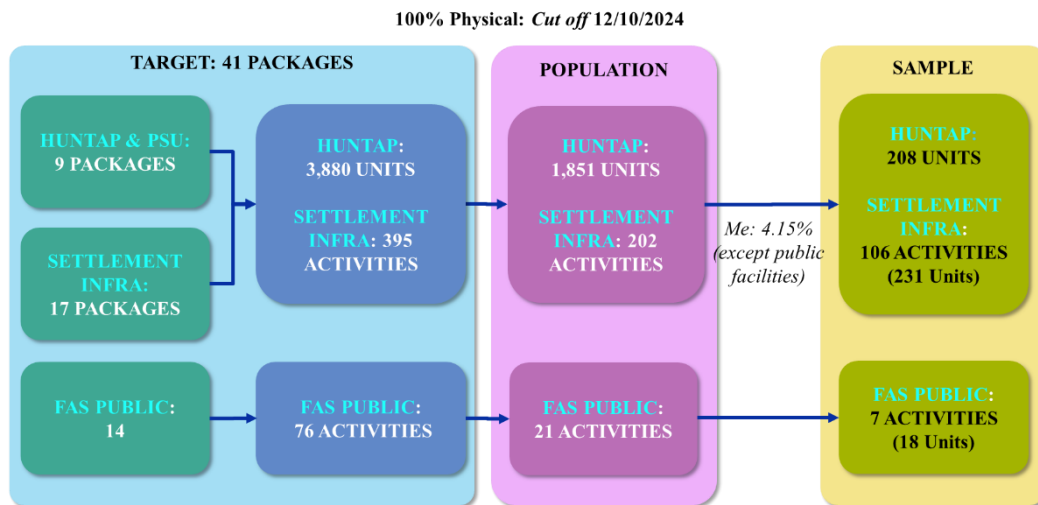
No.	Public Facilities	Sample	Investment Value (IDR)	Sample Details	Respondents
<b>1</b>	<b>Healthcare Facilities</b>				
	HEALTH CENTER	a. Rehabilitation of Tipo Health Center, Palu City	1.023.796.000	1st Floor: Entrance, Hallway, Laboratory, Emergency Room, General Clinic, Dental Clinic, MCH Clinic, Pharmacy, Registration Counter, Lobby, Pharmacy Installation, 2nd Floor: Warehouse, WC, Nutrition Clinic, Musholla, Kitchen, Treasurer's Room, Administration Room, Slasar, Hall, MTES, Program Room, Head of Puskesmas Room)	10
	HOSPITAL	b. Rehabilitation & Reconstruction of Anutapura Hospital package 2B	11.289.936.000	Cassowary Care Building, CT Scan Building, Archive Building, Blood Transfusion Unit Building, Swallow Care Building, Sanitation Building Administration Building, Radiology Building, Obstetrics Installation Building	10
<b>2</b>	<b>Education Service Facilities</b>				
	ELEMENTARY /MIDDLE SCHOOL	a. Rehabilitation & Reconstruction of SD IT Insan Gemilang Palu City	4.021.478.722	Classroom, Library, Teacher's room, Toilet, Teacher's room	10
		b. Rehabilitation & Reconstruction of Donggala Inspres Elementary School Kodi, Palu	2.894.538.748	Classroom, Library, UKS room, Teacher's room, Toilet, Teacher's room	10
	JUNIOR/ SENIOR HIGH SCHOOL	a. Rehabilitation & Reconstruction of SMP 19 Sigi	5.065.998.608	Classroom, Library, UKS room, Teacher's room, Toilet, Teacher's room	10
		b. Rehabilitation & Reconstruction of Adventist Junior High School Palu	1.920.044.437	Classroom, Office, Laboratory, Teacher's room, Toilet	10
<b>3</b>	<b>Other Building</b>				
	GOVERNMENT BUILDING	Rehabilitation & Reconstruction of Kejati Sulteng Building, Palu	134.519.452.000	1. Basement 1st Floor: Car Parking, Elevator Lobby, Canteen, Generator room, Archive Room, Hydrant GWT, Clean water GWT, Clean Water Pump RG, Travo RG, PLN RG, Emergency Staircase	10

No.	Public Facilities	Sample	Investment Value (IDR)	Sample Details	Respondents
				2. 2nd Floor: Main Lobby, PTSP, Service Room, Staff and Leader's Office, Meeting Room, Toilet, Lactation and Disabled Room, Elevator Lobby, Emergency Stairs 3. 3rd Floor: Void, Staff and Leader's Office, Archive Room, Meeting Room, Pantry Room, Toilet, Rest Room, Living Room, Elevator Lobby, Emergency Stairs 4. 4th Floor: Waiting Room, Meeting Room, Examination Room, Archive Room, Staff and Leader's Office, Rest Room, Special Staff Room, Toilet, Pantry, Elevator Lobby, Emergency Stairs 5. 5th Floor: Waiting Room, Meeting Room, Examination Room, Archive Room, Staff and Leader's Office, Rest Room, Special Staff Room, Toilet, Pantry, Elevator Lobby, Emergency Stairs 6. 6th Floor: Meeting Room, Dining Room, Warehouse, Meeting Room, Stage, Audio Room, Toilet, Pantry, Elevator Lobby, Emergency Stairs 7. Top Floor. Bitumen Roof, Emergency Stairs, Open Space Floor	
<b>T O T A L</b>					<b>70</b>

### 3.4.6.3. Observation sample of Public Facility infrastructure quality

For the infrastructure observation sample, with the same confidence level and a maximum margin of error of 5%, the survey margin of error is designed at 4.15%, still meeting the maximum requirement. At the data cut off position of October 31, 2024, the sampling method is as depicted in the following graph:





**Figure 16. Infrastructure Quality Observation Sampling Method**

The detailed data of the infrastructure observation sample is depicted in the following table:

**Table 19. Detailed sample of Infrastructure Quality Observation**

No	Component Type	Infrastructure Component	Infrastructure Component Details	Population (act)	Sample (act)	Sample (unit)
1	Huntap	Perumahan	Rumah Khusus Pasca Bencana	1851		208
	Jumlah Huntap			1851	-	208
2	Infra Permukiman	Drainase Lingkungan	Drainase Lingkungan	22	16	37
			Kolam Retensi	3	2	2
		Jalan Lingkungan	Jalan Aspal Hotmix	14	14	34
			Jalan Beton	8	4	6
			Jalan Rabat Beton	2	2	4
			Talud	4	1	2
			Tembok Penahan (Siring/Plengsengan/Bronjong)	6	3	12
		MCK	MCK	2	1	1
		Penerangan Umum	Penerangan Umum (inc. PJU)	21	14	33
		Pengelolaan Air Limbah	Bangunan IPAL	3	2	2
			Gedung Reaktor	3	2	2
			Instalasi Pengolahan Lumpur Tinja (IPLT)	2	2	2
			Kantor IPLT	2	2	2
			Peralatan Reaktor	2	2	2
		Pengelolaan Persampahan	Depo Persampahan	1	1	1
		Penyediaan Air Minum	Perpipaan Air Minum (transmisi, Distribusi, Pelayanan)	29	11	23
			Reservoir	6	1	1
			Sambungan Rumah	35	10	46
			Sumur Bor	5	2	2
			Sumur Bor Dalam (SBD)/Sumur Arteris	13	7	10
		Sarana Ruang Terbuka Hijau	Ruang Terbuka Hijau (Taman Lingkungan, Taman rekreasi/hiburan)	14	5	5
			Toilet RTP/RTH	2	1	1
		Sarana Sosial Budaya	Balai Pertemuan Warga/Meeting Hall	3	1	1
		Jumlah Infra Permukiman				202
Total Huntap dan Infrastruktur Permukiman				2053	106	439
3	Infra Publik	Sarana Kantor Pemerintahan	Sarana Kantor Pemerintahan	1	1	6
		Sarana Kesehatan	Sarana Kesehatan	14	2	4
		Sarana Pendidikan	Sarana Pendidikan	6	4	8
	Jumlah Infra Publik			21	7	18
Grand Total			2074	113	457	

### 3.5. Analysis Method

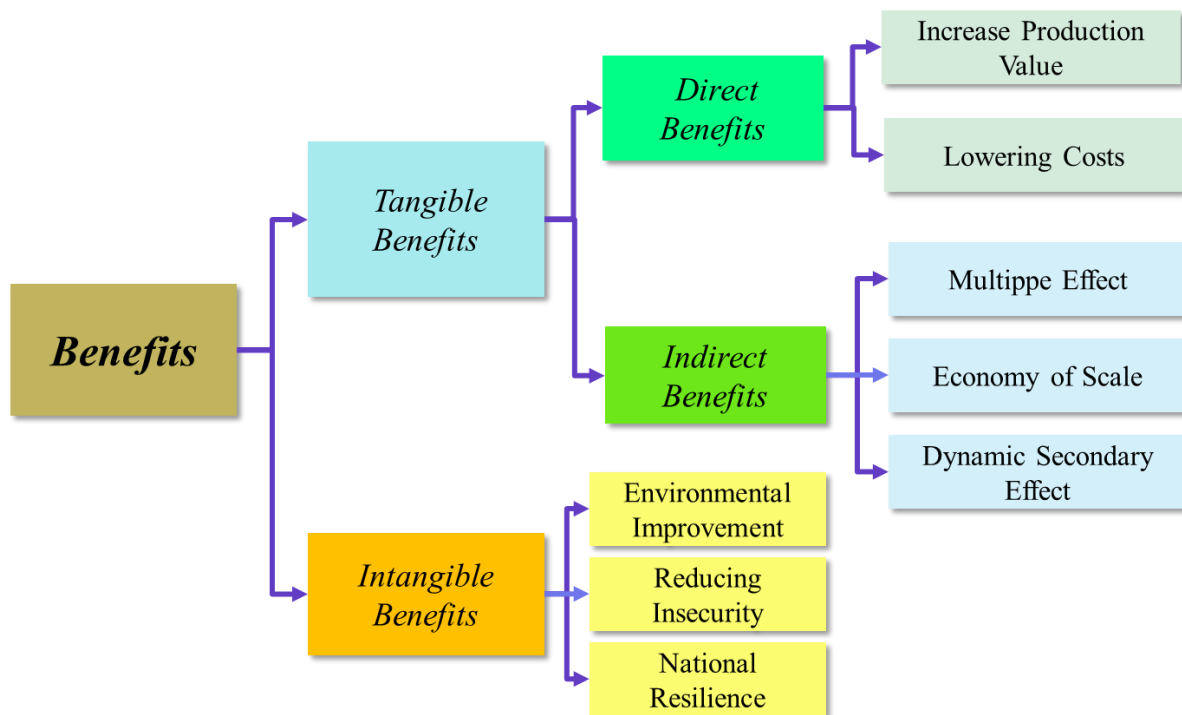
#### 3.5.1. Definition of Benefits

According to the Big Indonesian Dictionary (KBBI), the definition of benefit is use or profit or profit. From the above understanding, it can be said that the benefits obtained will certainly cause changes to a certain function in an institution.

Benefits according to Mangkoesoebroto, (1998), Musgrave and Musgrave, (1989) can be divided into three, namely:

1. Direct benefits; Direct Benefits Benefits received as a result of the project, such as an increase in the value of the production of goods or services, a change in form, a decrease in costs, and others. The increase in production value can be due to the increase in the number of products and the quality of the products as a result of the project. For example:  
a. Increase in rice production due to irrigation, b. Decrease in transportation costs due to road improvements, c. Improved job description among workers due to improved work methods.
2. Indirect benefits; Benefits that arise as a multiplier effect of the project built on other development activities. Example: road improvements cause various community activities to arise in utilizing the economic potential along the road built, then the existence of a campus or college which causes various activities that are generated for the surrounding community and utilize the existing potential, for example meeting the needs of students.
3. **Intangible** benefits; Benefits from project development that are difficult to measure in monetary terms, such as changes in people's mindsets, environmental improvements, reduced unemployment, increased national resilience, price level stability, etc. \

Meanwhile, according to Choliq et al. (1999), benefits are generally divided into two basic groups: tangible and intangible. *Tangible* benefits tend to be clearly visible in evaluating or in other words, it is defined as the benefits of savings or improvements in the company that can be measured quantitatively in the form of a monetary value, for example, the benefits of the existence of a college for the surrounding business owners. Intangible benefits are difficult to measure, in other words defined as benefits that are difficult or impossible to measure in monetary value, such as providing good information, or can improve the decision-making ability of an individual and it is difficult to know the ultimate benefit in increasing the company's profitability, another example is the benefits due to poor service to customers. (intangible benefits) are not included in the calculation of cash flow, but indirectly customer satisfaction will affect the value of sales. The following description illustrates the benefits of an agricultural development project.



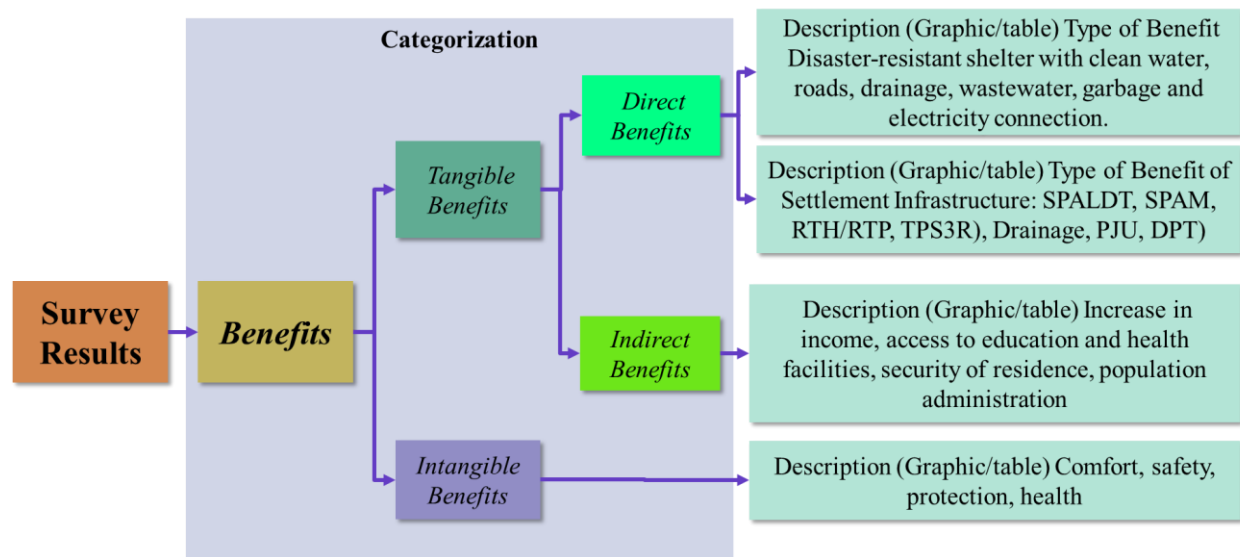
Source: Introduction to Project Evaluation Second Edition

**Figure 17. Example of Benefits in Agricultural Development**

### 3.5.2. Methods for analyzing the benefits of CSRRP shelters and settlement infrastructure

When referring to the concept of benefits as described in the previous section, the process to analyze the benefits of CSRRP is as follows:

1. The data on the benefits of survey results related to shelter and settlement infrastructure, especially on aspects of resilience, especially building resilience, is examined.
2. Categorizing as well as analytical description based on 2 (two) major parts, namely:
  - a. Tangible Benefits; Housing benefits that can be seen physically and can be calculated in the form of monetary value, which consists of:
    - i. Direct benefits divided into 2 (two) major groups)
      - 1) Benefits of shelter and basic facilities: Description (Graphic/table) Benefits of disaster-resistant shelters with clean water, roads, drainage, wastewater, garbage and electricity connections
      - 2) Settlement infrastructure benefits supporting shelters; Description (Graphic/table) Types of settlement infrastructure benefits: SPALDT, SPAM, RTH / RTP, TPS3R), Drainage, PJU, DPT)
    - ii. Indirect benefits; Description (Graphic/table) Increased income, access to education and health facilities, security of residence, population administration
  - b. Intangible Benefits; Description (Graphic/table) Comfort, safety, protection, health



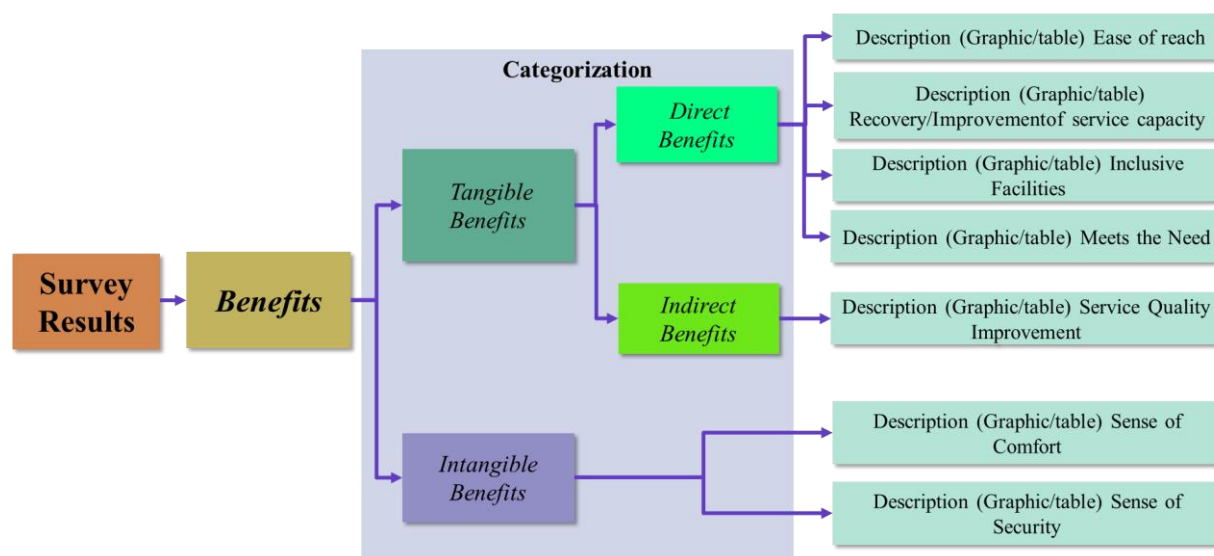
**Figure 18. Benefit Analysis Method of Huntap and Settlement Infrastructure**

### 3.5.3. Benefit analysis method of CSRRP Public Facility Rehabilitation and Reconstruction

Likewise, the benefits of rehabilitation and reconstruction of CSRRP public facilities can be classified into 2 (two) major groups, namely:

1. The data on the benefits of survey results related to the rehabilitation and reconstruction of public facilities, especially on aspects of resilience, especially building resilience and inclusiveness, will be examined.
2. Categorizing as well as analytical description based on 2 (two) major parts, namely:
  - a. **Tangible Benefits**; Benefits of public facilities that can be seen physically and can be calculated in the form of monetary value, which consists of:
    - i. Direct benefits; divided into 2 (two major groups); Description (Graphic/table), among others, related to building resilience, ease of access, restoration of service capacity, inclusive facilities.
    - i. Indirect benefits; Description (Graphic/table) of service quality improvement
  - b. **Intangible benefits**; Description (Graphic/table) Comfort and safety.

The analysis method is outlined as follows:



**Figure 19. Public Facility Benefit Analysis Method**

### 3.5.4. Economic Analysis of CSRRP

#### 3.5.4.1. Principles of the Triple Dividend of Resilience Framework (TDRF)

In the context of Rehabilitation and Reconstruction, to assess the benefits of CSRRP, a cost-benefit analysis (CBA) methodology will be used. The main objective is to evaluate the economic benefits of component 1 and component 2. CBA will model the potential benefits of specific building types. This analysis produces two main outputs - Net Present Value (NPV) and Economic Rate of Return (ERR).

To assess the benefits of CSRRP, among others, the Cost Benefit Analysis (CBA) method is used. CBA in relation to disaster risk management-related investments refers to the principles derived from the Triple Dividend of Resilience Framework (TDRF), namely:

1. **Avoiding losses during disasters;** This includes saving lives and reducing the number of people affected, minimizing direct costs to infrastructure and other assets, and reducing indirect and direct economic losses,
2. **Stimulating economic activity due to reduced disaster risk;** Risk reduction to engender investor confidence, expand corporate planning horizons, and increase land value, and
3. **Co-benefits, or uses, of specific disaster risk management (DRM) investments;** for example, improving community-based disaster preparedness can lead to increased involvement of women in community-level activities, strengthening DRM capacity can lead to improved governance and more organized social structures.

Constrained by data availability, CBA focuses on measuring the benefits of (i) avoiding losses when disasters occur and will thus ignore the true benefits of disaster-resistant buildings.

### 3.5.4.2. Value Statistic of Life (VSL)

To calculate the value of economic benefits associated with avoiding losses, at least include the following aspects: 1) Reduction in potential loss of life due to disasters 2) Decrease in potential loss of livelihood due to disasters 3) Decrease in potential loss of assets due to disasters

One approach to quantifying the potential cost of loss of life is to look at Willingness to pay, which is an appropriate way to estimate the value of reducing the risk of unexpected death by chance - known as the Value Statistic Of Life (VSL).

The main concept of value of statistical life (VSL) is an estimate of the value society places on reducing mortality risk. By convention, a life is assumed to be a young adult's life for at least the next 40 years. It is a statistical life because it is not a specific person's life. The value of a statistical life is best measured by estimating how much society is willing to pay to reduce the risk of death. Complex assumptions were used to derive this estimate, and a sensitivity analysis must be conducted as part of the cost-benefit analysis.

Monetization of avoided mortality using the VSL concept with a 2024 figure, with the "benefit transfer" method, and VSL elasticity equal to PAD, that method for estimating VSL for Indonesia is based on VSL estimates from developed countries (See Cropper and Sahin, 2009). We chose a VSL estimate from the US Environmental Protection Agency that equaled US\$9.7 million. Adjustment of the US-based VSL requires the ratio of Indonesian and US GDP per capita. In addition, following the recommendation of Cropper and Sahin (2009) to account for differences in risk preferences between Indonesians and Americans, a VSL elasticity of 1.5 was assumed. For the year 2024, using the same approach, the VSL value for Indonesia is illustrated in the following table:

**Table 20. VSL calculation for Indonesia in 2024**

Indicator	Start of Project (2016)	End of Project (2024)
VSL America	9.700.000	13.100.000
Indonesia's real GDP per capita (PPP)	10.766	14.805
US real GDP per capita (PPP)	53.399	66.451
Income elasticity of VSL	1,5	1,5
VSL Indonesia estimation	878.156	1.377.627

Following the sensitivity analysis, chapter 2, which for component 1, is -23%, the Indonesian VSL figure for component 1 is \$1,060,773.

### 3.5.4.3. Explanation of Economic Analysis

#### Project Objectives

1. The expected project outcome is to rebuild and strengthen public facilities and safer housing in damaged areas. In addition to rebuilding, rehabilitating, and repairing damaged public facilities in damage-affected areas in Central Sulawesi, the project also rebuilt permanent housing units and settlement infrastructure.

## Efficiency

1. Efficiency measures how economically resources and inputs are converted into results. For development projects, whether the costs incurred to achieve the project objectives are reasonable compared to the benefits and prevailing norms. The extent to which the project achieves the maximum possible benefits (outputs, outcomes, and impacts) with specific inputs or costs (IEG-World Bank Group, Last Revision: May 2024).
2. The NPV and IRR/EIRR of the CSRRP were estimated at project appraisal in the PAD, resulting in a Project NPV of US\$159,991,945 and an EIRR of 25%. In this Final Evaluation, the calculations were re-calculated based on information available at the time of CSRRP expiry, presenting updated data as realized, and at an actual cost percentage of 91% of the total allocated project cost of US\$150 million.
3. The efficiency analysis in this final evaluation uses cost-benefit analysis to estimate the net benefits of all project costs. The unit of analysis is the project, with costs and benefits observed in the sub-projects (activities) under each project component. The objective of this analysis is to calculate the Net Present Value (NPV) and Economic Internal Rate of Return (EIRR) of the Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP).

## Project Cost

1. Table 21 summarizes the cost of each component and whether it was included in the economic analysis. The investment expenditure is assumed to be the actual project cost incurred in 2019-2024, the operation and maintenance cost is calculated for 11 years from 2025 to 2035 and is assumed to be 10 percent of the investment expenditure in 2025 (the initial year of utilization) and increases every year at a rate adjusted for each building type (see description of Operation & Maintenance/O&M below).
2. The total actual cost of CSRRP as of October 11, 2024 is US\$ 135,837,791.24 (91% of the total allocated cost of US\$150 million). An efficiency analysis (B/C, NPV and EIRR) of the total investment of US\$150 million was conducted on all actual costs, including the actual cost of Component 1 of US\$83,405,080.42, the actual cost of Component-2 of US\$37,137,986.95, and the actual cost of Component-3 of US\$15,294,723.86.
3. There is other financing outside of the grant/loan in the form of land provision from the government, local government and communities that is not included in the investment/project cost calculation (nor in the calculation of the increased value of benefits) amounting to US\$15.05 million. The value of the land is considered in the leverage calculation of the grant.



**Table 21. Entry Components in Economic Analysis**

COMPONENTS & ACTIVITIES	
<b>Component 1. Resilient construction of permanent housing units and settlement infrastructure</b>	Yes
1.1. Construction of settlement infrastructure in new locations	Yes
1.2. Civil works - construction of housing units	Yes
1.3. Community-based reconstruction of housing units and community-scale settlement infrastructure in Central Sulawesi	Yes
<b>Component 2. Resilient reconstruction and strengthening of public facilities</b>	Yes
2.1. Education Facilities	Yes
2.2. Health Facilities	Yes
2.3. Other Public Facilities	Yes
<b>Component 3. Project Implementation Support</b>	Yes

## Project Benefits and Methodology

1. This section details the cost-benefit analysis (CBA) methodology. The main objective is to evaluate the economic benefits of CSRRP, through analysis of the economic costs and benefits of Component 1 and Component 2. The analysis produces two main outputs: Net Present Value (NPV) and Economic Internal Rate of Returns (EIRR).
2. The cost-benefit analysis was conducted about the economic analysis approach undertaken earlier in the project (presented in Annex-3 of the PAD under the heading Economic Analysis) which relied on principles derived from the World Bank's Triple Dividend of Resilience Framework (TDRF). The TDRF outlines three potential development benefits of investing in disaster risk management before the event occurs (ex-ante). The economic benefits analysis of ESC focuses on two of the three types of potential benefits:
  - a. **Avoiding losses when disasters occur.** This includes saving lives and reducing the number of people affected, minimizing direct costs to infrastructure and other assets, and reducing direct and indirect economic losses. *This economic analysis focuses on the benefits of avoiding the risk of death, and avoiding the risk of disaster damage losses.*
  - b. **Stimulate economic activity due to reduced disaster risk.** The PAD states that risk reduction can inspire investor confidence, broaden corporate planning horizons and increase land values. *This economic analysis focuses on beneficiary households' economic activities of permanent housing, water supply services, and other settlement infrastructure.*
  - c. **Co-benefits from the development, or use, of specific DRM investments.** For example, improved community-based disaster preparedness can lead to

increased involvement of women in community-level activities, strengthened DRM capacity can lead to better governance and more organized social structures. *While an economic analysis of co-benefits was not conducted on this occasion, a partial qualitative description of the forms of co-benefits is provided in the results of the study on local government capacity in disaster management.*

3. Based on the World Bank's TDRF principles, the analysis of economic benefits of CSRRP investments in this final evaluation focuses on;
  - a. **Benefits associated with future disaster events.** Losses that can be avoided when a similar disaster occurs, namely; (a) avoiding the potential risk of death (saving lives), and (b) avoiding the potential risk of disaster damage losses.
  - b. **Benefits through "with" and "without project" scenarios.** These benefits include; (a) the benefit of recovering potential lost wages due to damage to basic education facilities (schools) that impact the graduation rate of students associated with potential wages that will be lost, and (b) the benefit of recovering potential lost health days due to damage to health facilities associated with potential lost wages per day;
  - c. **Benefits that are independent or unrelated to future disasters.** Stimulating household economic activity due to reduced disaster risk and improved (at least restored) access to basic settlement infrastructure for beneficiaries who receive permanent housing resettlement services to new locations. These benefits include those obtained by beneficiaries outside the permanent housing construction site related to the construction of drinking water, sewage and solid waste facilities. The benefits of public/green open space and meeting buildings were not estimated due to data limitations.
4. **Data Source:** input data used for economic analysis (CBA/BCA) comes from project cost realization reports, reports on the number of beneficiaries issued by the *Project Management Unit (PMU) through the Project Management Consultant (PMC)* for the 2020-2024 period. Benefit analysis input data comes from primary data from the Evaluation and Study Consultant (ESC) beneficiary household survey, secondary data on health profiles, school/education profiles, the state of workers in Indonesia, economic statistics, ESC study results, CSRRP *Project Appraisal Document (PAD)* and scientific journals.
5. **The overall framework of the Project, Component 1, Component 2, and Component 3.** The unit analyzed was the CSRRP Project by observing the Costs and Benefits of Component 1 and Component 2. Measuring the economic benefits of the construction of permanent housing units and residential infrastructure, water and drinking water infrastructure, and other residential infrastructure that serves beneficiaries outside the shelter, as well as the development of residential environmental infrastructure through community grants under Component 1 financing. For Component 2, the economic benefits analyzed result from the rehabilitation and reconstruction of educational facilities, health facilities and other public facilities. The

main principle is to measure the economic benefits of the resulting building. Component 3 costs are included in the calculation of the aggregation of the Project to be part of the overall financing of the Project, this is because the value of benefits arising from Components 1 and 2 is also supported by financing in Component 3. The calculation of the discount factor is set at an interest rate of 10% according to the assumption of PAD.

**Formula, Measures, and Criteria.** The calculation formula used is the CBA formula, commonly used to evaluate cost and project efficiency. The main objective is to compare all costs and benefits of an investment. The measures used are Benefit Cost Ratio, Net Present Value (NPV), and Economic Internal Rate of Return (EIRR). The project's NPV or net present value is the sum of the net present value of each year multiplied by the annual discount factor at the specified interest rate and investment period. The cost benefit ratio is the total value of benefits divided by the total value of costs within the specified investment period. While the economic rate of return is the result of dividing the future value of the project investment divided by the current value. The project is said to be feasible if; a) NPV is greater than 0, b) B/C Ratio > 1, and c) EIRR > discount rate/interest rate.

To calculate the economic benefits of component 1, the assumptions used are as follows:

- a. Component 1 costs **US\$83,405,080.42**, consisting of:
  - i. The cost of construction of permanent housing and settlement infrastructure amounted to **\$67,387,369.84**, consisting of the cost of construction of permanent housing amounting to US\$45,376,478.32, plus the cost of settlement infrastructure in new locations for financing; a) Construction of Settlement Infrastructure Tondo 2 Area, Palu City at US\$8,339,087.23 (as of October 11, 2024, the allocated contract value is US\$9,416,363.59), b) Construction of Settlement Infrastructure Talise Area, Palu City at US\$6,784,772.42 (as of October 11, 2024, the contract value allocated is US\$6,787,622.98), c) Construction of Settlement Infrastructure I (Petobo) at US\$4,863,787.56 (as of October 11, 2024, the contract value allocated is US\$5,017,815.04), and d) Construction of Water Treatment Plant 2x30 L/s Poboya for Huntap Tondo 1, Tondo 2 & Talise, Palu City amounting to US\$2,255,122.01 (as of October 11, 2024, the contract value allocated is US\$2,899,253.12). The benefits of this financing are calculated by adding the benefits of shelter construction at CSRRP sites to the benefits of clean water services alone received by beneficiaries outside CSRRP sites.
  - ii. The cost of infrastructure development for water supply settlements for the service area outside the CSRRP huntap amounted to **US\$6,543,888.34**, consisting of costs for the construction of; (i) Construction of Water Treatment Plant 1x20 L/s for Huntap Duyu, Palu City; (ii) Construction of Bora SPAM IKK Piping Network for Huntap Pombewe, Sigi Regency; (iii) Construction of Water Treatment Plant 1x20 L/s and SPAM Piping Network for Huntap Pombewe, Sigi Regency; (iv) Optimization of SPAM Piping Network for Poboya and Huntap Duyu, Palu City; (v)

- Construction of Water Distribution Pipe and House Connection in Palu City; (vi) Construction of Water Distribution Pipe and House Connection in Sigi Regency.
- iii. The cost of construction of other settlement infrastructure for services outside CSRRP (Non-CSRRP) shelters amounted to **US\$6,291,882.16**, consisted of costs for the construction of; (i) Construction of Settlement Infrastructure Tondo 1 Area Phase II, Palu City; (ii) Construction of Settlement Infrastructure Balaroa Area Phase II, Palu City; (iii) Construction of Settlement Infrastructure Pombewe Area Phase II, Sigi Regency; (iv) Construction of Supporting Infrastructure for Satellite Huntap in Central Sulawesi Province; (v) Optimization of IPLT in Palu City and Sigi Regency; (vi) Optimization of TPS3R in Palu City and Sigi Regency; and (vii) Construction of Public Facilities and Green Open Space for Satellite Huntap Phase I-B.
  - iv. The cost of developing neighborhood-scale settlement infrastructure through the community grant financing scheme is **US\$2,950,062.38**.
- b. The total benefit value of Component 1 is **US\$1,757,342,195**, sourced from shelter and settlement infrastructure benefits, namely;
- i. Household economic stimulus of **US\$21,348,756**, derived from the calculation of income/expenditure of US\$13 per capita per month of shelter beneficiaries (household survey results) multiplied by the number of shelter beneficiaries of 12,441 people,
  - ii. The value of clean water/drinking service benefits for beneficiaries outside CSRRP permanent settlements amounted to **US\$ 26,594,324**, derived from the calculation of income/expenditure of US\$ 3.7 per capita per month (household survey results) received by 8,930 beneficiaries living in Nanumbuku, Vatu, Kinta and Tondo 1 as well as beneficiaries scattered in the service area of each clean water facility outside CSRRP permanent settlements.
  - iii. The benefit value of other settlement infrastructure services such as roads, drainage, public street lighting, STP for beneficiaries outside CSRRP shelters amounted to **US\$27,092,275** derived from the calculation of income/expenditure of US\$12.0 per capita per month (household survey results) received by 15,678 beneficiaries.
  - iv. The value of the benefits of avoiding the potential risk of loss of building damage due to disasters is **US\$ 62,559,917**, which is 80% of the investment value of housing and settlement infrastructure, clean water, other settlement infrastructure,
  - v. The value of benefits from neighborhood-scale infrastructure development through the Community Grant scheme amounted to **US\$18,913,541**, derived from the calculation of benefits of US\$7.3 per capita per month (household survey results) received by 19,628 beneficiaries.

- vi. The value of benefits from avoiding the risk of death (saving life) amounted to **US\$1,600,833,381**, sourced from multiplying the VSL figure by the number of database victims of the 2018 Central Sulawesi death disaster.

As for the calculation of component 2, the assumptions used are as follows:

- a. Component 2 cost of **US\$37,137,986.95**, consisting of:
  - i. The cost of rehabilitation and reconstruction of educational facilities amounted to **US\$20,307,746.26**, consisting of investment in rehabilitation and reconstruction of Basic Education facilities of US\$2,951,376.63, and rehabilitation and reconstruction of Tadulako University of US\$17,356,369.63.
  - ii. The cost of rehabilitation and reconstruction of Health Facilities amounting to **\$5,100,415.15** consists of investments for rehabilitation and reconstruction of Puskesmas Tipo US\$69,791.08, Undata Hospital US\$3,542,773.06, Anutapura Hospital US\$1,258,950.51, and Tora Belo Hospital US\$228,900.49.
  - iii. The cost of rehabilitation and reconstruction of other Public Facilities amounted to **US\$11,729,825.55**.
- b. The benefit value of Component 2 amounted to **US\$5,090,941,330**, sourced from the benefits of rehabilitation and reconstruction of educational facilities, health facilities, and other public facilities, namely;
  - i. The value of the benefits of avoiding the risk of death (saving life) in elementary schools, Undata Hospital, Anutapura Hospital, and Tipo Health Center (the benefits of avoiding the risk of death at Tadulako University and Tora Belo Hospital were not calculated due to limited data on the average number of people who move per day in the building), which amounted to **US\$5,033,986,659**.
  - ii. The value of the benefit of avoiding the risk of loss of building damage due to disasters amounted to **US\$30,471,651**, which comes from multiplying the estimated maximum loss opportunity of 16.5% for educational facility buildings and 19.7% for health facility buildings and other public facilities (see maximum damage estimation below) by the investment value.
  - iii. Benefit value of recovered potential wage loss (for basic education facilities) using "with" and "without project" scenarios. The value of lost potential wages recovered as a result of school reconstruction is **US\$1,711,767**, derived from multiplying the potential lost wages per year by US\$11,188.02 (i.e. 70% of the value of lost potential wages due to school damage) projected to increase each year accumulatively until year 17. The 70% assumption is taken from the PAD assumption for reconstructed school buildings that still leave 30% operational. The economic value of potential wage recovery is calculated from 2019. The figure of US\$11,188.02 was obtained from calculating the difference in wage levels of primary, junior secondary and senior secondary school graduates in the absence of the project, taking 2021 figures (as a proxy, ideally using 2019 figures). The number of students was taken from the

school profile data of SDIT Insan Gemilang Sigi, SMP Negeri 19 Sigi, SD Inpres Donggala Kodi Palu City, and SD-SMP-SMA Advent Palu City.

- iv. The value of benefits derived from the recovery of potential lost health days amounted to **US\$24,771,253**, obtained from the recovery of outpatient services (for health facilities, except Tora Belo Hospital) using the "with" and "without project" scenarios. The recovery value of potential healthy days of **US\$1,905,481** per year is calculated from 2023, projected to be constant until year 17. The projected healthy days are assumed to be continuous because decreases and increases can be affected by varying types of illness and other variables (possible pandemic). The value is obtained from healthy days obtained from outpatient services for the age group 15-64 years at Undata Hospital, Anutapura, and Tipo Health Center, amounting to 249,790 healthy days per year<sup>2</sup>. The economic value is obtained from multiplying the value of a daily wage of \$7.63 (sourced from the average wage of the 2021 Indonesian labor condition report).

**Table 22. Potential Lost Wages "Without Project"**

	Learners	Wage Rate (IDR)	Wages Without Project (Rp)	Wage Difference (Rp)	Total Wage Difference (Rp)
SD	469	1,986,400.00	1,633,406.00	352,994.00	165,554,186.00
SMP	162	2,235,533.00	1,986,400.00	249,133.00	40,359,546.00
HIGH SCHOOL	61	2,790,116.00	2,235,533.00	554,583.00	33,829,563.00
Total	692				239,743,295.00
Value of Potential Lost Wages recovered (US\$)					<b>15,982.89</b>
70% Value of Potential Lost Wages (US\$)					<b>11,188.02</b>

## 6. Component Cost - 3.

The calculated cost realization of Component 3 is **US\$15,294,724**. This cost consists of; a) Project Management Consultant (PMC) Central Sulawesi Rehabilitation and Reconstruction Project (CSR RP) of US\$ 4,242,389.22, b) Technical Management Consultant (TMC) - 1 Central Sulawesi Rehabilitation and Reconstruction Project (CSR RP) of US\$ 3,793,555.49, c) Technical Management Consultant (TMC) - 2 Central Sulawesi Rehabilitation and Reconstruction Project (CSR RP) of US\$

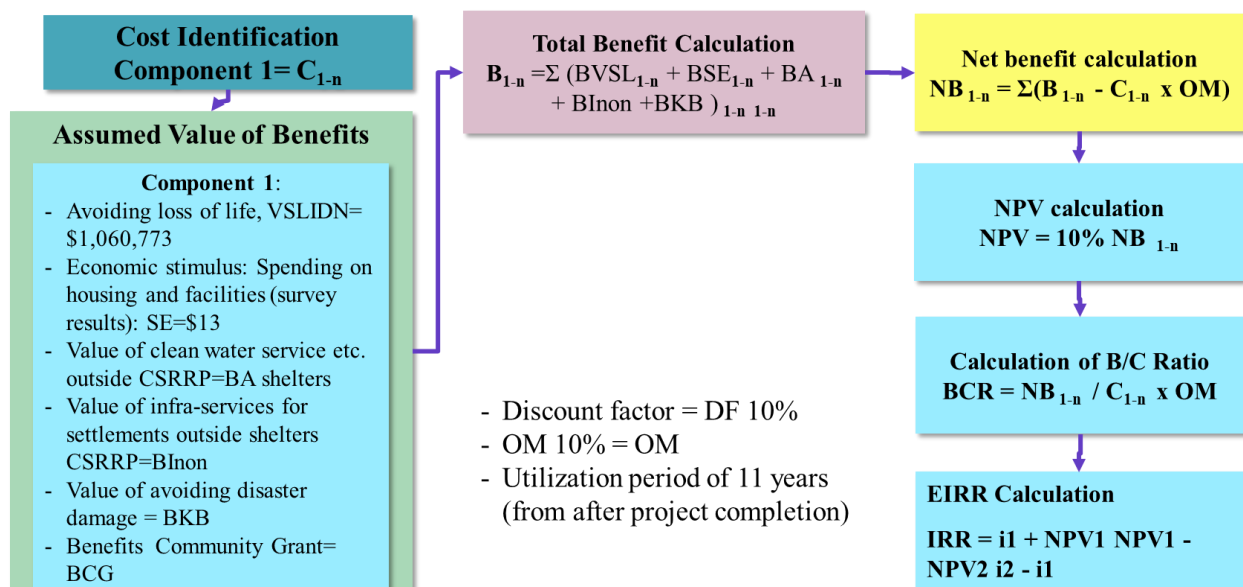
<sup>2</sup> The method of calculating healthy days technically refers to the method used in the economic analysis of PAD, namely by conducting a simple regression analysis of sick complaint data and outpatient data from Undata Hospital, Anutapura Hospital, and Tipo Health Center in 2019-2023, and assuming a sick day for 3 days (doctor's recommendation) and interpreting the regression coefficient as a healthy day.



2,043,333.67, d) Evaluation and Study Consultant (ESC) Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) US\$332,902.76, e) Individual Consultant Senior Program Development Specialist US\$104,796.71, f) Individual Consultant Program Control and Analysis Specialist for Housing Provision Sector US\$102,383.83, g) Individual Consultant Settlement Development Specialist US\$102,812.33, h) Individual Consultant Junior Settlement Development Specialist US\$45,763.84, i) Non Consultant Service for Oversight Service Provider (OSP) of Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) amounting to US\$4,526,786.02.

#### 3.5.4.4. Component Efficiency Analysis Method 1

To calculate the efficiency value of component 1, the process description is as follows:



**Figure 20. Component 1 Benefits Analysis Method**

The steps taken are as follows:

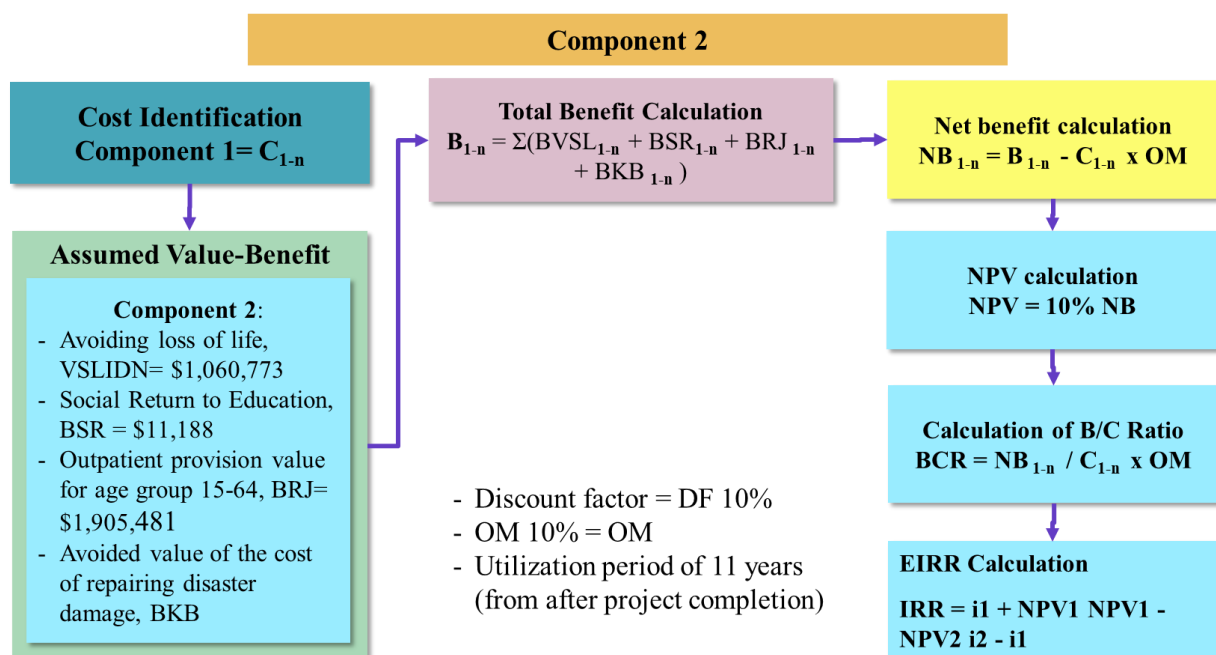
1. First calculate the cost for component 1, this cost includes the entire cost of component 1 except the cost of Revitalization of Damaged Huntap Phase I-A under NSUP-CERC and the cost for local infrastructure scale (ISL), which is obtained from:
  - a. Housing and Settlement Infrastructure (+OM)
  - b. Non-CSRRP Drinking Water (+OM)
  - c. Non-CSRRP Settlement Infrastructure (+OM)
  - d. Environmental-Scale Infrastructure Value (+OM)
2. Furthermore, based on the assumptions that have been presented before, the value of benefits is calculated:



- a. Avoided loss of life, VSLIDN= \$1,060,773, the value of the benefit of loss of life is VSL times the number of deaths avoided (approximately the number of deaths in 2018 x about 90%).
  - b. Economic stimulus: Expenditure on housing and facilities (survey results): SE=\$13, obtained from survey data that the household expenditure rate for per capita per month is \$13 multiplied by the number of beneficiaries of shelter and settlement infrastructure for 11 years.
  - c. The value of clean water services outside CSRRP shelters, derived from the value of clean water expenditure of approximately \$2.1 per capita per month, multiplied by the number of beneficiaries of clean water services outside shelters over 11 years.
  - d. The value of settlement infrastructure services outside CSRRP shelters, preferably from waste-related settlement infrastructure, is \$0.3 multiplied by the number of settlement infrastructure beneficiaries over 11 years.
  - e. The value of avoiding disaster damage is calculated from all component 1 investments multiplied by about 70% (an assumed value of buildings that can survive in the event of a disaster).
3. Value of benefits Environmental-scale infrastructure
  4. The benefit value is then totaled, and the net benefit is calculated, which is obtained from the total benefit minus the total cost.
  5. Furthermore, NPV is the multiplication of the discount factor against the net benefit for one year, the B/C ratio and EIRR can also be calculated.

### 3.5.4.5. Component Efficient Analysis Method 2

To calculate the efficiency value of component 2, the process is as described in the following scheme:



## Figure 21. Component 2 Efficiency Analysis Method

The steps taken are more or less as follows:

1. First calculate the cost for component 2, this cost includes the entire cost of component 2, which is obtained from:
  - a. Fasdik Investment (+OM)
  - b. Facility Investment (+OM)
  - c. Other Fasum Investment (+OM)
2. Furthermore, based on the assumptions that have been presented before, the value of benefits is calculated:
  - a. Avoided loss of life, VSLIDN= \$1,060,773, times the number of avoidable deaths of component 2 beneficiaries
  - b. Social Return to Education, BSR = \$11,188 over approximately 17 years of school operation
  - c. Value of providing outpatient care for age group 15-64, BRJ= \$1,905,481 over approximately 11 years of operating life
  - d. Value avoided by the cost of repairing disaster damage, about 70% of the total investment
3. The benefit value is then totaled, and the net benefit is calculated, which is obtained from the total benefit minus the total cost.
4. Furthermore, NPV is calculated which is the multiplication of the discount factor against the net benefit for one year, the B/C ratio and EIRR can also be calculated.

### 3.5.4.6. Unity Analysis Method of Infrastructure Types

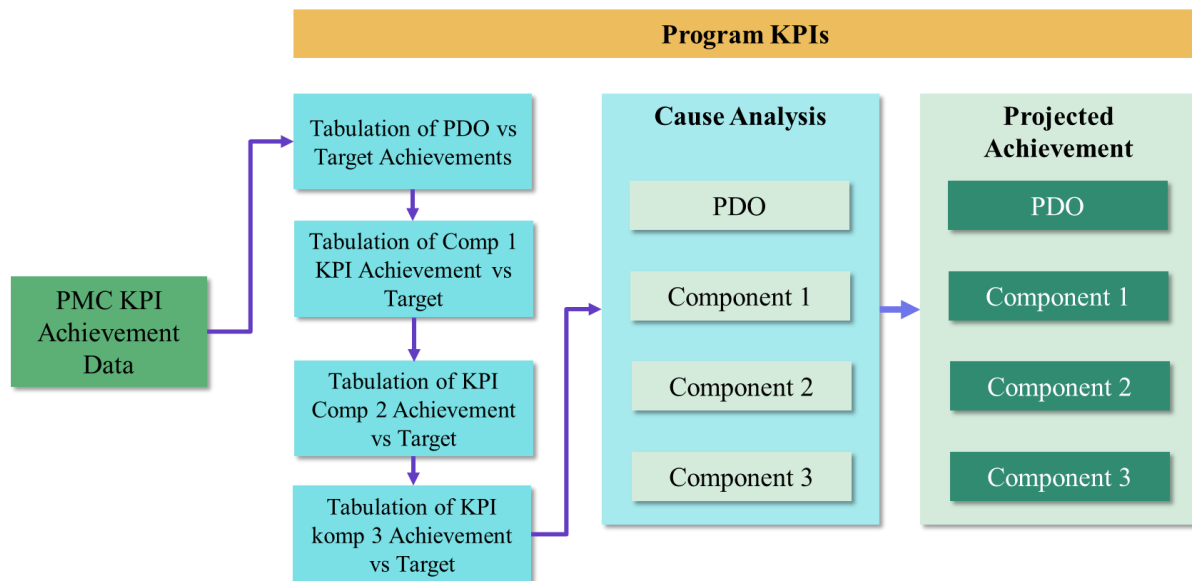
For the analysis of efficiency per unit of infrastructure type, it is carried out by comparing the construction cost based on the Calculation of Engineering Estimate (EE) with the Construction Cost according to the Contract where the Self-Calculation Price (HPS) & Contract of each Construction Work package as per LPSE Data, with the following categories:

1. RISHA House Efficiency T.36
2. Efficiency of RISHA House + Persil PSU
3. Efficiency of RISHA House + Persil PSU + Huntap Settlement Infrastructure
4. Efficiency of Shelter Settlement Infrastructure (Per Shelter Area)
1. Efficiency of Public Facilities

## 3.6. Program Achievement Analysis Method

### 3.6.1. Program Achievement Analysis

To see the achievement of the program, it is measured by the extent to which the PDOs and KPIs are achieved. The steps taken are described in the following scheme:



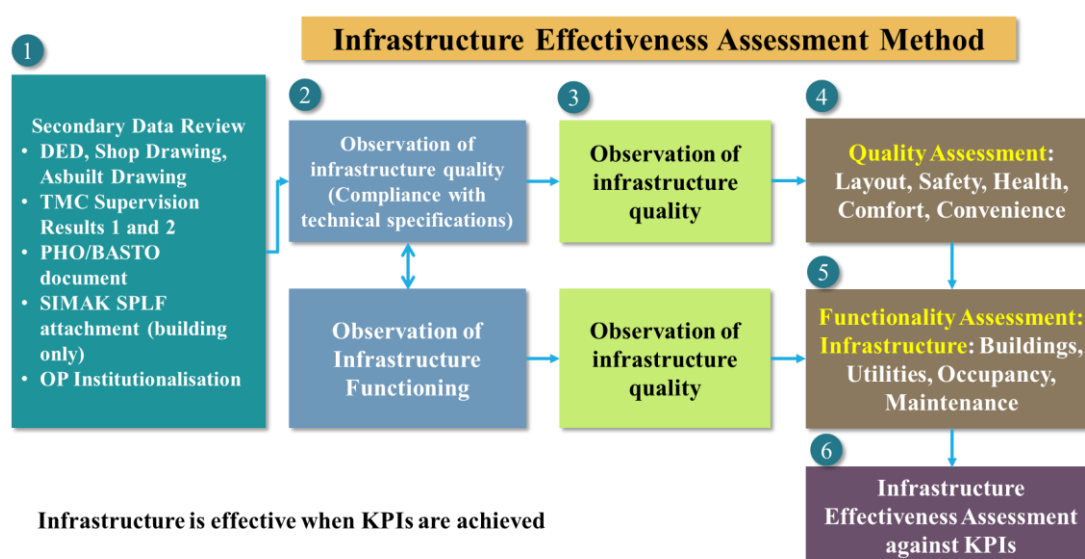
**Figure 22. Schematic of Program Achievement**

The steps taken are more or less:

1. Review KPI achievement data sourced from the PMC database.
2. Then analyze the achievements of each component and indicator, especially related to the direct cause why the KPI was not achieved.
3. The results of the analysis are displayed as a whole, and summarized as program achievements

### 3.6.2. Infrastructure Effectiveness Analysis

Conducted in 2 stages of activity, the infrastructure quality assessment method, with the following stages:



**Figure 23. Stages of Infrastructure Quality Observation Process**

In more detail, the stages of the process are described as follows:

**Table 23. Stages of Implementation of Observation Activities**

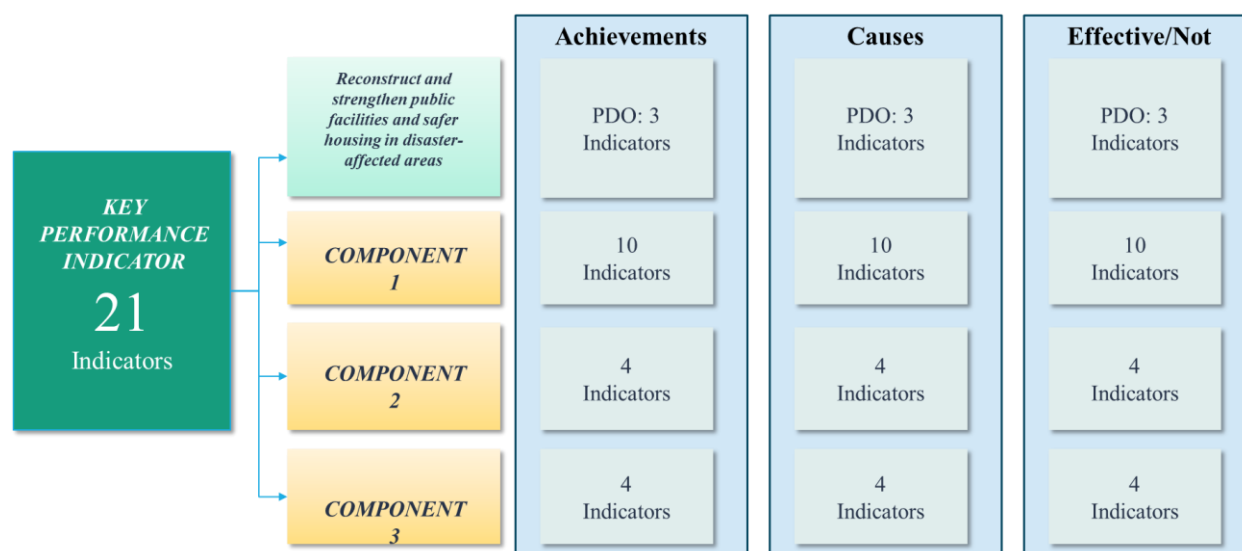
No .	Indicator	Destination	Output	Methods	Tools	Target/Actors	Supporting Data
1	Secondary Data Review	1. Obtain secondary project inspection results related to infrastructure activities 2. Utilize the data for infrastructure quality assessment	Detailed data on infrastructure activities in each unit/activity	Stakeholder survey and interviews	1. Stationery 2. Computer/ Laptop 3. Camera 4. Recording Device	1. Supervisor y Consultant 2. PMC Team 3. OSP Team 4. TMC Team 1 and 2	1. CSSRP Infrastructure Data 2. Technical Drawing/Asbuid Drawing 3. Work Plan and Requirements 4. TMC Supervision Results 1 and 2 5. PHO/BASTO Document 6. SIMAK PLF attachment (building only)
2	<b>Infrastructure Observation:</b>						
	Quality Check	Obtain data and information on the suitability of CSSRP built infrastructure according to technical specifications / Asbuilt Drawing according to the Observation Form	Quantitative data Infrastructure quality	Field observation	1. Stationery 2. Computer/ Laptop 3. Field Notes 4. Infrastructure Quality & Functioning Observation Form 5. Camera	Direct beneficiaries of Infrastructure	1. CSSRP Built Infrastructure Data 2. Technical Drawing/Asbuid Drawing 3. Work Plan and Requirements 4. Construction Implementation Monitoring Report

No.	Indicator	Destination	Output	Methods	Tools	Target/Actors	Supporting Data
					6. Recording Device, 7. Measuring Tool (Meter),		5. LIPPM data (Information and Problem Management Report) 6. Land Legality Document 7. PBG Completion Document 8. TMC Supervision Results 1 and 2 9. PHO/BASTO Document 10. SIMAK SPLF attachment (building only)
	Function Check	Obtain data and information on the functioning of CSSRP infrastructure, according to the Observation and Documentation Form.	Quantitative data on infrastructure functionality	Field observation	1. Stationery 2. Computer/Laptop 3. Field Notes 4. Infrastructure Functioning Observation Form 5. Camera 6. Recording Device,	1. Direct beneficiaries of Infrastructure 2. Infrastructure Manager	1. CSSRP Built Infrastructure Data 2. Report and Attachment of PHO, FHO, BASTO documents 3. Operation and Maintenance (O&M) Plan / O&M Manual 4. LIPPM data (Information and Problem Management Report) 5. SIMAK SPLF attachment (building only)
3	Descriptive statistical analysis	Summary of data characteristics, detailed and informative presentation of data	A detailed overview of the characteristics of the analyzed data	Excel and SPSS Analysis (Data Entry, Descriptive Analysis)	Stationery Computer/Laptop	3. ESC CSSRP Team	Observation data
4	Infrastructure Quality Assessment (Building Design, Safety, Health, Comfort, Convenience)	CSSRP built infrastructure quality assessment	CSSRP built infrastructure quality assessment results and recommendations	Desk study data analysis	Stationery Computer/Laptop	4. ESC CSSRP Team	Observation data, results of descriptive statistical analysis

No .	Indicator	Destination	Output	Methods	Tools	Target/Actors	Supporting Data
5	Infrastructure Functionality Assessment (Building, Utilities, Occupancy, Maintenance)	Assessment of the functionality of built infrastructure per unit of CSSRP infrastructure activity type	CSSRP built infrastructure quality effectiveness assessment results and recommendations	Desk study data analysis	Stationery Computer/ Laptop	5. ESC CSSRP Team	Observation data, results of descriptive statistical analysis
6	Infrastructure Effectiveness Assessment	Assessing the effectiveness of Infrastructure refers to KPI Indicators and Parameters	Results of Quality and Functionality Assessment	Data analytics	Stationery Computer/ Laptop	6. ESC CSSRP Team	Data on Infrastructure effectiveness results

### 3.7. Methods for Analyzing the Effectiveness of Institutional Arrangement

To assess the effectiveness of Institutional Structuring on Target Achievement (KPI), it is described with the following scheme:



**Figure 24. Effectiveness of Institutional Structuring on Target Achievement**

The steps are as follows:

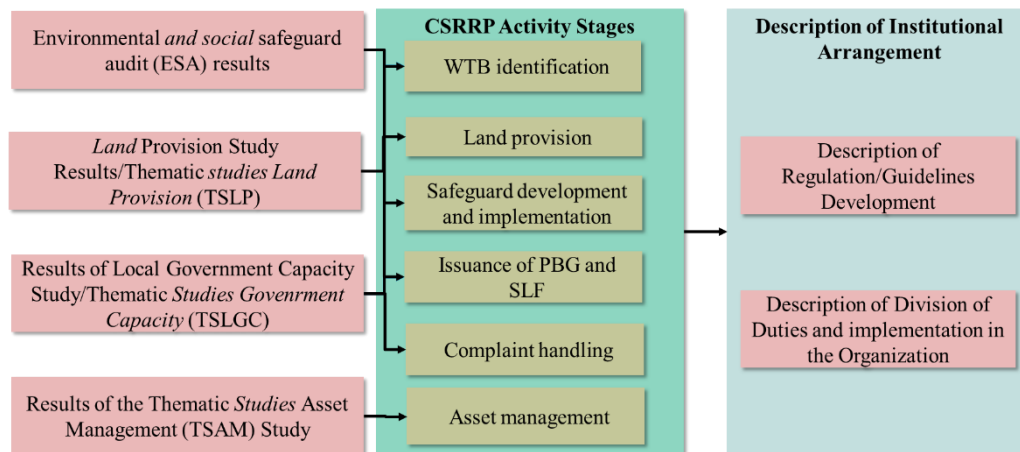
1. Review of previous KPI achievements
2. Cause analysis of KPI achievement
3. Assessment of the effectiveness of institutional structuring on each KPI achievement

Then an analysis was also carried out on the extent of the effectiveness of institutional structuring in achieving targets, especially in terms of:

1. WTB identification
2. Land provision

3. Safeguard development and implementation
4. Issuance of PBG and SLF
5. Complaint handling
6. Asset management

The analysis process is described in the following scheme:



**Figure 25. Analysis Method of Effectiveness of Institutional Arrangement**

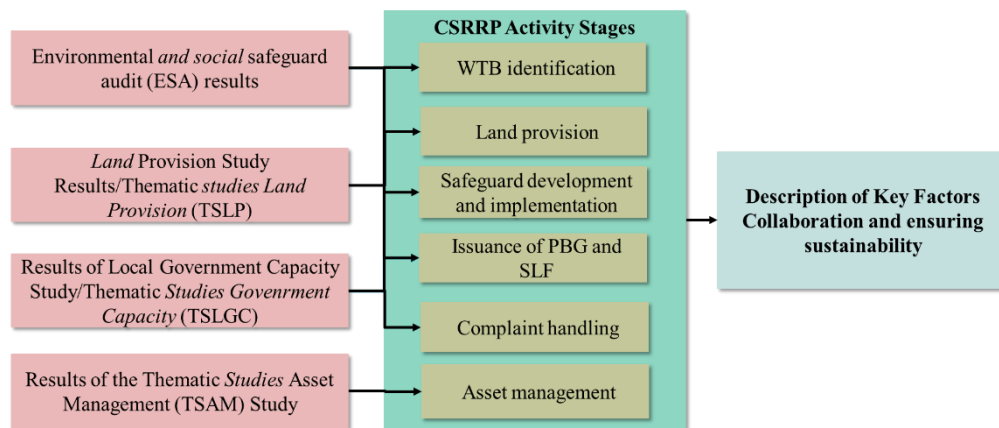
The steps are as follows:

1. Looking back at the data and information obtained from the TSLP, ESA, TSLGC and TSAM studies, in the aspects mentioned above
2. Identify in each study, especially in relation to institutions, the development of regulations/guidelines required for the implementation of CSRRP activities and a description of the division of tasks between actors in the CSRRP organizational structure at each stage.
3. Presents an analytical description of the effectiveness of institutional arrangements in CSRRP.

### 3.8. Key Factor Analysis Methods in Institutional Collaboration and Sustainability Assurance

To identify the key factors in collaboration and ensuring sustainability, the stages of analysis were carried out as presented in the following scheme:





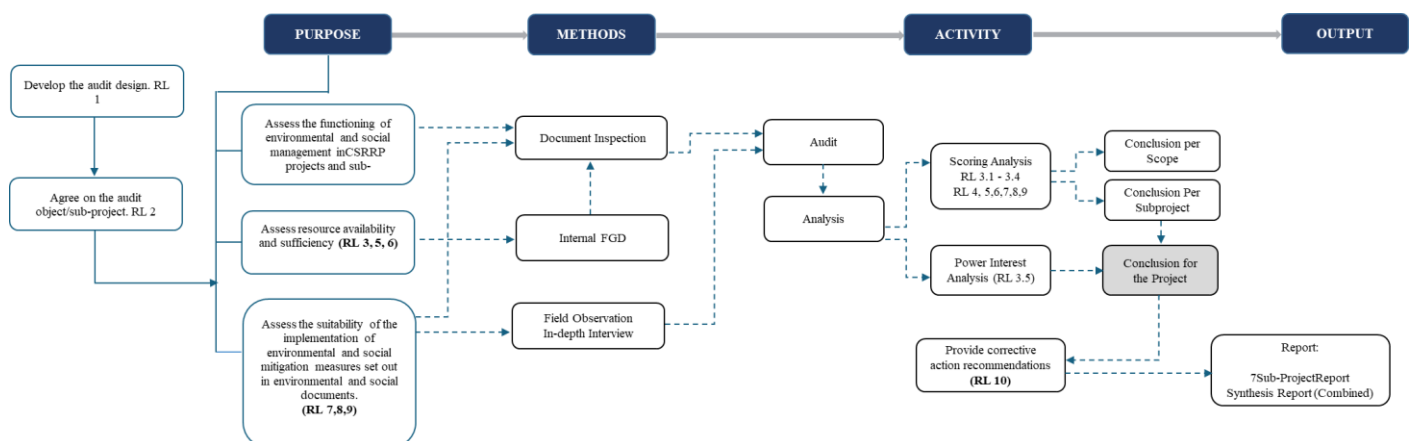
**Figure 26. Key Factor Analysis Method in Institutional Collaboration and Sustainability Assurance**

Similar to the previous section, to analyze the key factors, the results of the study are important, and the following steps are taken:

1. Looking back at the data and information obtained from the TSLP, ESA, TSLGC and TSAM studies, in the aspects mentioned above
2. Identify in each study especially what factors support collaboration between actors in each stage.
3. Presents a description of the analysis of key factors for institutional collaboration and ensuring sustainability in CSRRP.

### 3.9. Methods for analyzing compliance with social and environmental safeguards management and the 5 principles of implementation in CSRRP

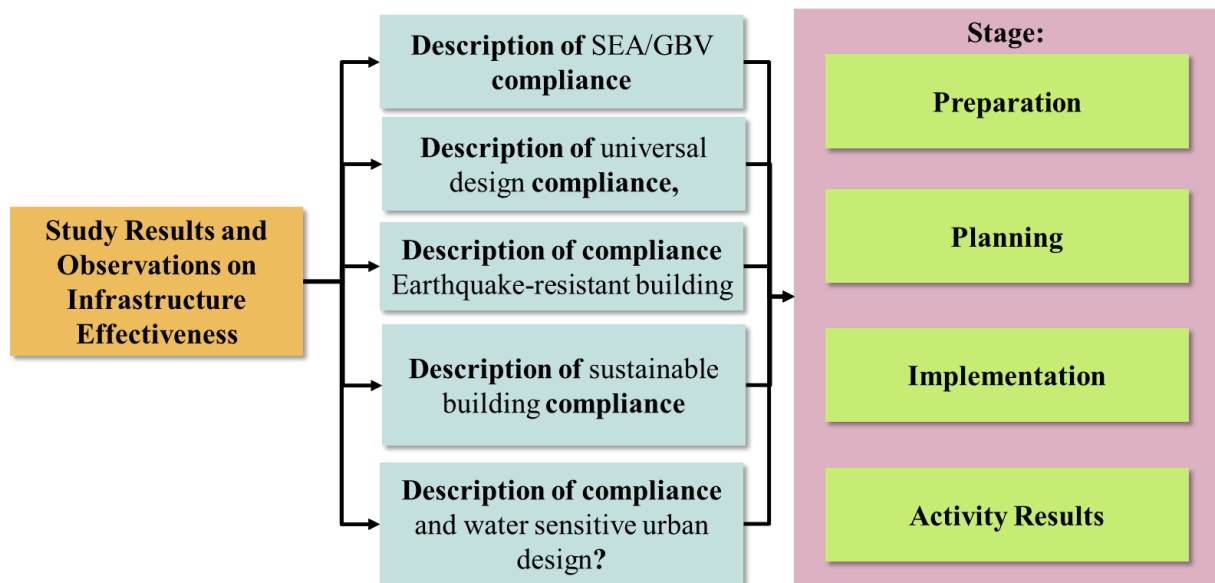
To analyze compliance, there is 1 study that is the main information, namely from Environmental and Social Audit studies (ESA) and the second from the results of Infrastructure Observation. For ESA compliance using the following analysis methods carried out in ESA studies:



**Figure 27. Compliance Analysis Method for Social and Environmental Security Management in CSRRP**

Meanwhile, regarding compliance with the 5 principles of construction development

implementation in the CSRRP program, it is carried out by the following method:



**Figure 28. Compliance Analysis Method for Social and Environmental Security Management in CSRRP by Results of Infrastructure Observation**

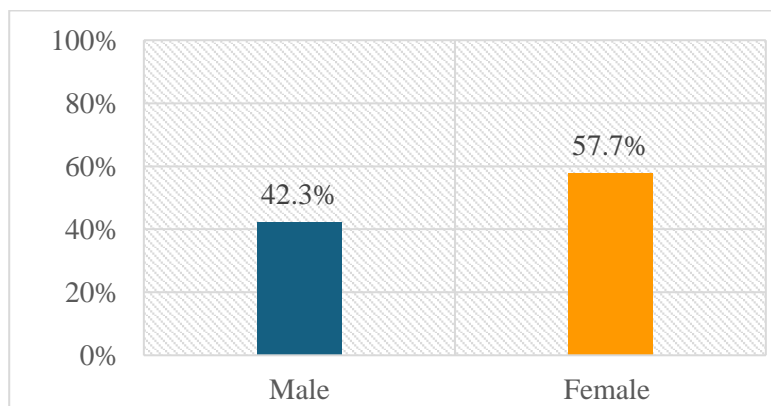
1. Reviewing the data and information obtained from the ESA study especially related to Social and Environmental Safeguards Management and GBV.
2. Observations to see the application of the 5 principles of construction implementation in CSRRP.
3. Present a description of the analysis of social and environmental safeguard compliance, and the application of the 5 principles of CSRRP implementation.

## CHAPTER 4 EVALUATION RESULTS

### 4.1. Respondent Profile

The profile of respondents based on the FE CSRRP survey is as follows:

#### A. Gender



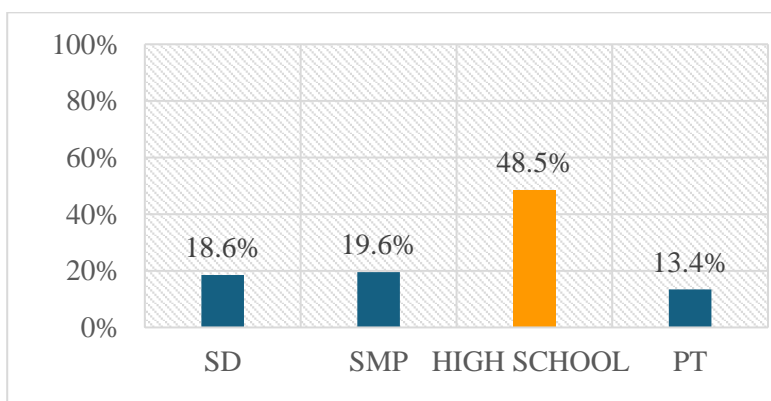
**Figure 29. Gender of WTB**

The graph above shows the **distribution of respondents by gender**. From the data shown, it can be seen that:

- **42.3% of respondents were male.**
- **57.7% of respondents were female.**

This distribution reflects that more female than male respondents were in the survey.

#### B. Education level



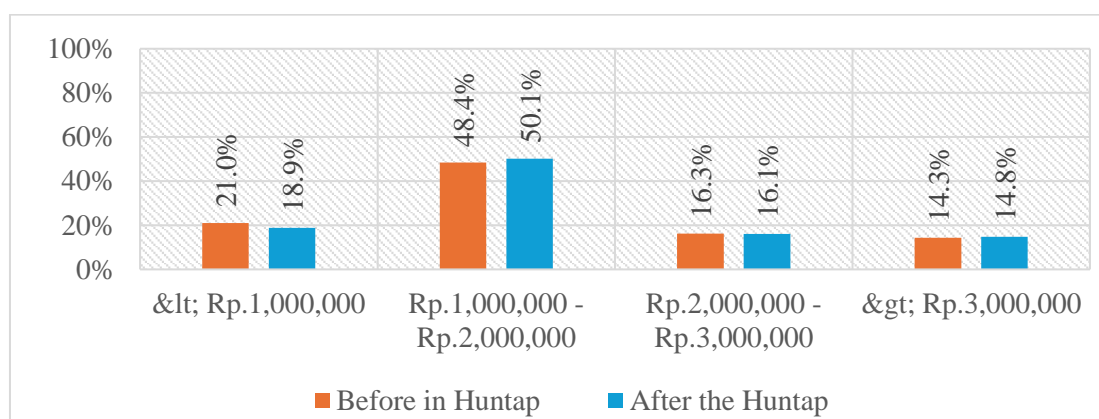
**Figure 30. Highest Education of Household Head**

The graph above illustrates the **highest level of education** attained by the respondents' household heads in the survey. From the graph, it can be elaborated as follows:

- **18.6% of household heads** have the highest level of education at the **primary school** level.
- **19.6% of household heads** have completed **junior high school**.
- **48.5% of household heads** completed **senior high school**, the largest percentage in this survey.
- **13.4% of household heads** have **Higher Education (HE)**, which includes a diploma, bachelor's degree, or higher education.

This distribution shows that most household heads have an education up to senior high school level.

### C. Livelihood



**Figure 31. Income/Monthly Earnings from Main Occupation**

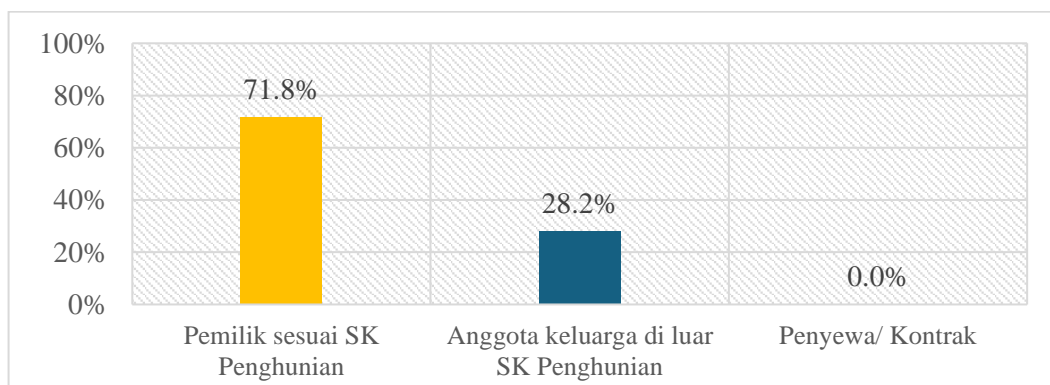
The graph above shows **income/income per month from the main job before and after living in permanent housing (Huntap)** in several income categories. The following is a description based on the data displayed:

- **Income below Rp.1,000,000:**
  - Before living in Huntap, **21.0% of families** had an income below Rp.1,000,000.
  - After living in the Huntap, this percentage decreased slightly to **18.9%**.
  - This decrease indicates an improvement in the very low income families group after moving to the Huntap.
- **Income Rp.1,000,000 - Rp.2,000,000:**
  - Before living in Huntap, **48.4% of families** had an income of Rp.1,000,000 to Rp.2,000,000.
  - After living in a Huntap, this percentage increased to **50.1%**.
  - This increase shows that most families remain in this income range, with a slight increase in the number of families with incomes in this range.
- **Income Rp.2,000,000 - Rp.3,000,000:**
  - Before living in Huntap, **16.3% of families** had an income of Rp.2,000,000 to Rp.3,000,000.

- After living in a Huntap, the percentage decreased slightly to **16.1%**.
- This shows stability within the middle-income family group.
- **Income of more than Rp.3,000,000:**
  - Before living in Huntap, **14.3%** of families had an income of more than Rp.3,000,000.
  - After living in a Huntap, the percentage increased slightly to **14.8%**.
  - This increase shows that some families experienced increased income after living in the Huntap.

The graph of income/income per month from the main job shows a slight increase in income after the family moved to the Huntap, especially in the low-income group. In general, the income distribution shows stability with a slight positive shift in income categories after moving to the Huntap.

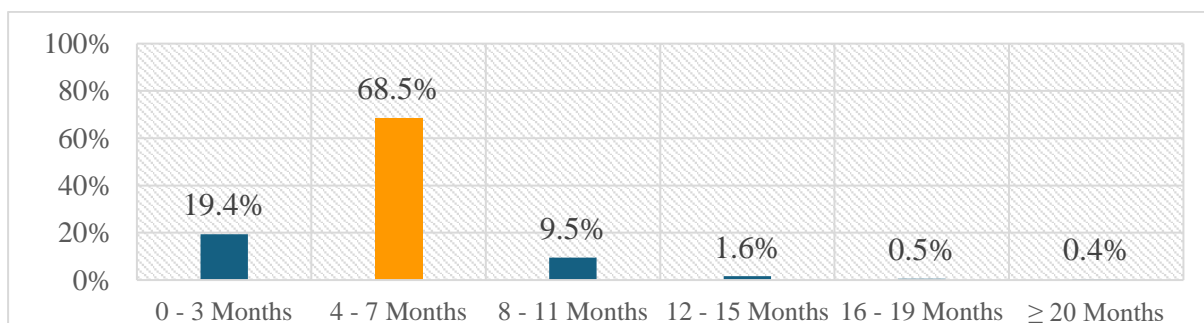
#### D. Resident Status



**Figure 32. Occupancy Status**

The graph above illustrates the status of residents based on the survey, it can be seen that the majority of residents (71.8%) are owners in accordance with the Decree (SK) of occupancy. Meanwhile, 28.2% of the residents are family members who are not covered by the residence decree.

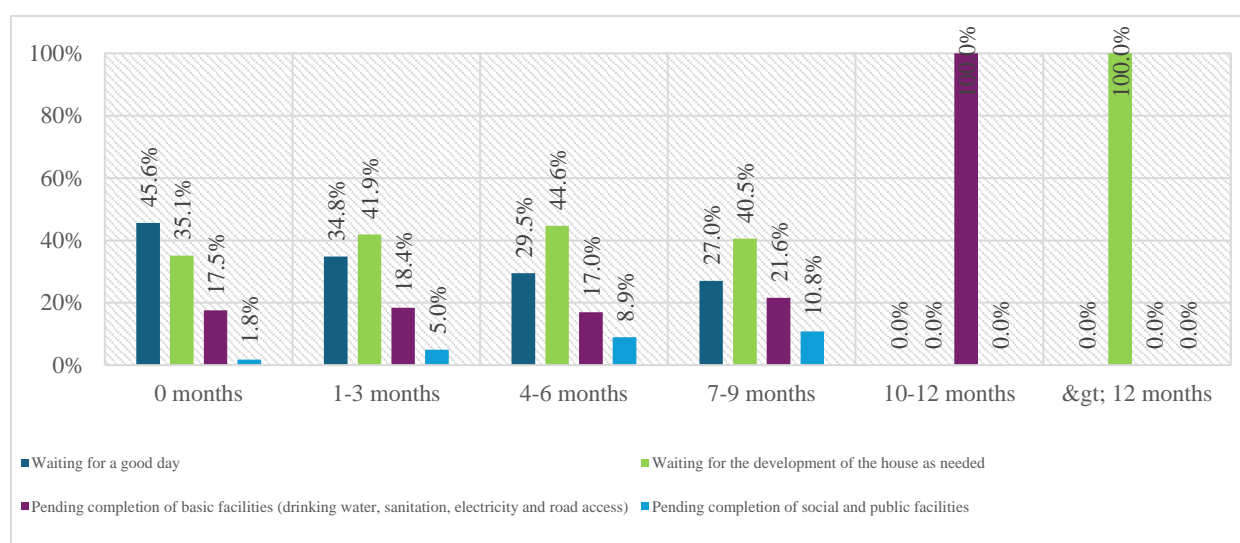
#### E. Length of Residence



**Figure 33. Length of Residence**

The graph above illustrates the distribution of the duration of occupancy of the surveyed respondents, from the data displayed, most of the residents, namely 68.5%, have lived in their properties for 4 to 7 months. Meanwhile, 19.4% of new residents occupied the property for 0 to 3 months, and 9.5% had been there for 8 to 11 months. Residents who stayed longer, i.e. between 12 to 15 months and 16 to 19 months, accounted for only 1.6% and 0.5% of the total respondents, respectively. Only a small fraction, 0.4%, have occupied the property for more than 20 months,

## F. Waiting Time Against Reasons for Waiting



**Figure 34. Waiting Time Against Reasons for Waiting**

The graph above shows different reasons for waiting depending on the duration of time before the occupants occupy the shelter. At the time of the zero month, most residents (45.6%) are waiting for a day either associated with customs or beliefs, while 35.1% are waiting for the completeness of basic facilities such as drinking water, sanitation, electricity, and road access. When entering the 1-3 month period, the portion waiting for home development as needed increased to 34.8%, and those waiting for the completeness of basic facilities decreased to 17.1%. The dependence on the completeness of social and public facilities became most prominent in the period of 7-9 months, where overall, the waiting reasons related to these facilities reached 100%, indicating that the residents need to be fully satisfied before starting their residence. This analysis describes how customary factors, developing housing needs, and infrastructure completeness affect the decision of time to start occupying a house, reflecting various needs and priorities of occupancy.

## G. Waiting Time for Income of Huntap Residents



**Figure 35. Waiting Time for Income of Huntap Residents**

The graph above illustrates the relationship between the waiting time for occupancy and the income level of Permanent Housing residents (Huntap). From the graph, it can be seen that in the first month, the largest percentage of residents who choose to occupy housing immediately are those with incomes below Rp 1,000,000, reaching 17.5%. In contrast, for those with higher incomes, i.e. Rp 3,000,000 or more, 10% choose to occupy housing in 4-6 months and 50% choose waiting time of more than 12 months, indicating the possibility that residents with higher incomes have greater flexibility in choosing when to move based on the availability or desired housing conditions. In general, this graph indicates a trend where residents with lower incomes tend not to delay moving, while those with higher incomes more often choose to postpone moving, possibly due to considerations for the quality or completeness of residential facilities.

## 4.2. Benefits

### 4.2.1. Benefits of Shelter and Settlement Infrastructure

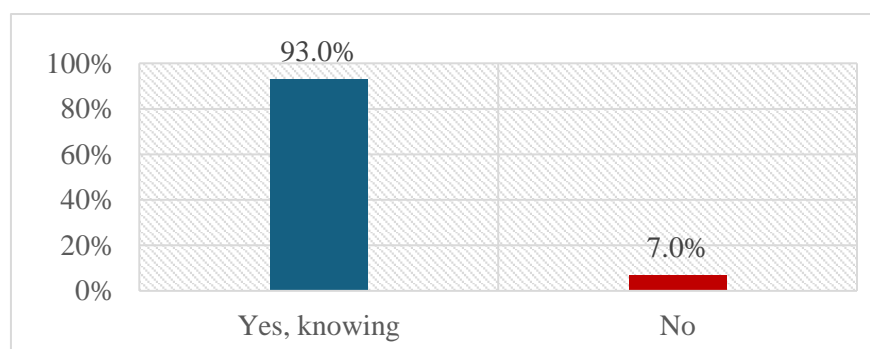
This section outlines in detail the benefits of shelters and settlement infrastructure, which has become a key aspect of permanent housing rehabilitation and reconstruction program. In post-disaster recovery efforts, the importance of resilient settlement infrastructure development cannot be overlooked, as this not only strengthens a community's physical resilience to natural disasters, but also significantly improves the quality of life of its residents. Therefore, this section provides a comprehensive analysis of the positive impacts resulting from infrastructure development and rehabilitation in Huntap, covering everything from the availability of basic services to the socio-economic improvement of residents. The main objective of this discussion is to evaluate the extent to which these infrastructure projects have achieved their expected objectives and contributed to the sustainable recovery of the affected communities.



## 1) Benefits of Huntap Development

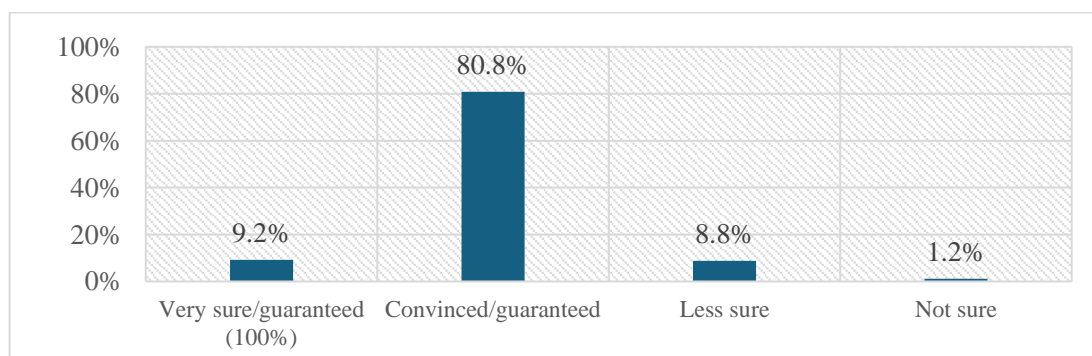


This section provides a detailed description of the benefits of the permanent housing project as perceived by the recipients. Based on the results of the survey, community perceptions regarding the benefits of building earthquake-resistant houses and resilient housing infrastructure. In this presentation, the data presented shows that most respondents, namely 93%, know that the house they live in has a design designed to withstand earthquakes. This indicates a high level of awareness of safety standards in housing construction.



**Figure 36. Respondents' Knowledge about the House They Live In Having an Earthquake Resistant House Design**

Furthermore, 80.8% of respondents stated they were very confident that the earthquake-resistant houses provided adequate security and safety, while 8.8% were only moderately confident of the protection provided. However, there were about 1.2% of respondents who were unsure of the effectiveness of the house in providing security. The slides are also enriched with visuals of two examples of earthquake-resistant houses, which illustrate the survey results and provide a tangible representation of the objects discussed.



**Figure 37. Respondents' Belief that Earthquake Resistant Houses Can Provide Security and Safety**

This information is critical to prove the effectiveness and importance of continued investment in safe and resilient building technologies. The data and visuals presented can be very helpful in advocating for further development policies that focus on improving building safety standards in earthquake-prone areas, supporting disaster mitigation efforts, and improving people's quality of life by providing safe and comfortable places to live.



Based on the results of the survey on the **benefits of clean water in permanent housing (Huntap)** provides a deep insight into how residents view the importance of clean water in their daily lives. From the data processed, 57.4% of respondents utilize the construction of clean water facilities in their homes for daily consumption activities such as drinking and cooking. This confirms that the existence of clean water is fundamental, not only for survival, but also for maintaining the health and well-being of the community.

A large proportion, 97.5% of respondents, consider clean water important for bathing and washing. This illustrates how crucial clean water is in maintaining good hygiene standards, affecting physical health and overall quality of life. Easily accessible clean water supports adequate hygiene routines and helps prevent the spread of disease, which is especially important in newly built or reconstructed communities after a disaster.

However, the survey also revealed that only 16.5% of respondents saw a direct benefit of clean water to their small business development. This suggests that while clean water is valued for personal and domestic needs, its potential to boost direct economic activity is still not fully explored or may not have been a focus in post-disaster recovery. This could be an area for further consideration in sustainable development planning, to integrate the economic benefits of clean water infrastructure more effectively.



**Table 24. Benefits of Clean Water Facility Development in Huntap**

No.	Benefit Type	Survey Results (%)
1	For consumption (eating and drinking)	57.4%
2	For cleaning (shower washing)	97.5%
3	For business	16.5%

The benefits of constructing clean water facilities in shelters highlight that while clean water is highly valued for basic needs and hygiene, there is still a great opportunity to utilize this vital resource in supporting and expanding economic benefits for disaster-affected communities. The widespread and integrated provision of clean water is key to recovery and inclusive and sustainable long-term development for communities in disaster areas.

**The construction of wastewater treatment facilities in permanent housing** has provided substantial benefits to the communities living there, as reflected in the positive response from most respondents in the survey. A total of 97.7% of respondents gave a high rating to the presence of effective sewerage. These systems play a crucial role in maintaining household hygiene and health, enabling better management of domestic waste and reducing the risk of contamination to living areas.

Furthermore, 85.8% of respondents reported improved household health, indicating that good wastewater treatment directly impacts their health. By reducing exposure to unmanaged sewage, these facilities help prevent the spread of diseases associated with poor sanitation, such as diarrhea and skin diseases. It also emphasizes the importance of access to proper sanitation as a fundamental component of public health.

Meanwhile, 58.2% of respondents perceived improved environmental health, reflecting the positive impact of wastewater treatment on neighborhood conditions. Efficient treatment facilities help reduce pollution and maintain the cleanliness of local water sources, which are critical to ecosystems as well as human health. By effectively managing and processing sewage, these facilities help preserve natural resources and ensure that the environment remains healthy and livable.

**Table 25. Benefits of Wastewater Treatment Facility Development in Huntap**

No.	Benefit Type	Survey Results (%)
1	<b>Usability of sanitation facilities (WC/Black Water)</b>	
a	Neighborhood sewerage	97.7%
b	Supports household health	85.8%
c	Supports environmental health	58.2%
2	<b>Usefulness of sanitation facilities (gray water)</b>	
a	For RT sewerage	97.3%
b	Supports household health	85.5%
c	Supports environmental health	57.8%

Overall, the construction of the wastewater treatment facility in Huntap demonstrates how investment in proper sanitation infrastructure improves the quality of daily life for residents and contributes to sustainable development. By strengthening sanitation systems, communities can build a strong foundation for better health, hygiene and environmental sustainability in the future.

Based on the survey results on the **benefits of the construction of waste system facilities in permanent housing**, it is clear that this infrastructure is very important for the health and cleanliness of the living environment. From the survey, 84.0% of respondents felt that household waste disposal has improved since the new waste system facilities. This shows the importance of having an effective waste management system to maintain household hygiene and comfort.

Furthermore, 71.1% of respondents acknowledged that the system supports their household's health, indicating that good waste management can minimize health risks from

poorly managed waste. This is important not only to prevent diseases, but also to improve the quality of daily life.

Regarding environmental health, 45.7% of respondents felt that the new waste system has helped improve their environmental health. Although the percentage is lower compared to other benefits, this figure still shows that good waste management positively impacts the overall environment, including reducing pollution and keeping public areas clean.

**Table 26. Benefits of Waste System Facility Development in Huntap**

No.	Benefit Type	Survey Results (%)
1	Household garbage disposal	84.0%
2	Supports household health	71.1%
3	Supports environmental health	45.7%

All of this data underscores how critical the development of efficient and effective waste system facilities is in the effort to create a healthier and cleaner environment for Huntap residents.

In an effort to improve the quality of infrastructure and comfort of residents in permanent housing, the construction of drainage systems has been a major focus in recent development projects. The survey results summarized in Table "**Benefits of Drainage System Construction in Huntap**" show the significant positive impact of this initiative on the daily lives of residents. 92.6% of respondents stated that the new drainage system has successfully reduced standing water and potential flooding that was previously a frequent problem in their residential area. This effect not only improves living comfort, but also provides a sense of security from the risk of property damage that can be caused by flooding.

Furthermore, 78.3% of respondents recognized that road damage in the Huntap environment had decreased with an effective drainage system. Good roads that are free from puddles support better mobility and accessibility for all residents, making daily activities smoother. In addition, the system also helps in the disposal of water from households, as expressed by 65.2% of respondents. This reflects improvements in domestic wastewater management, which may not have been properly addressed previously, providing a healthier and more hygienic environment.

**Table 27. Benefits of Drainage System Development in Huntap**

No.	Benefit Type	Survey Results (%)
1	Reduce inundation/potential flooding	92.6%
2	Prevent road damage	78.3%
3	Water discharge from households	65.2%

Overall data and feedback from residents show that the existence of a well-designed and effectively managed drainage system contributes greatly to improving living standards in the Huntap. Through these measures, the project not only addresses technical infrastructure issues but also proactively improves the quality of daily life of residents, which is in line



with the broader development objective of creating a safe, comfortable, and sustainable environment.

In the context of restoring and improving infrastructure in Permanent Housing (Huntap), the government and stakeholders have given special priority to the provision of electricity and road development. As reflected in the Table "**Benefits of Electricity and Road Provision in Huntap**", the results of this survey reveal a positive impact, which is significant in improving the living standards of Huntap residents.

A total of 91.2% of survey respondents expressed a marked improvement in electric lighting in their homes, a step forward that ensures comfort and safety at night. Stable and reliable electricity provision also supports daily activities, such as children's education at night and small business operations at home that were previously hampered by limited lighting.

The new road infrastructure has brought many benefits to the community. A total of 92.5% of respondents appreciated how these new roads connected them to main roads, which made transportation and accessibility easier. Correspondingly, 71.3% of respondents felt that better access to workplaces has opened up more employment opportunities and strengthened their economic stability. This shows how crucial connectivity is for local economic empowerment.



Improved access to markets by 60.1% of respondents was also felt to support local trade and the availability of daily goods, which became more efficient. This smooth economic activity indirectly improves the social and economic welfare of the Huntap community. Furthermore, 47.4% of

respondents felt that access to educational institutions became easier, allowing children to get a better and more consistent education.

In terms of health, 50% of respondents indicated that the new road makes it easier for them to access health facilities. This is especially important in emergency conditions, where quick access to medical care can be a deciding factor in saving lives. In addition, 42.6% of respondents felt that the new road infrastructure made it easier for them to access public services at village or sub-district offices, which are vital for taking care of government administration and services.

**Table 28. Benefits of Provision of Electricity and Roads in Huntap**

No.	Benefit Type	Survey Results (%)
1	Electric lighting at home	91.2%
2	Link to main road	92.5%
3	Easy access to the workplace	71.3%
4	Ease access to the market	60.1%
5	Ease of access to education	47.4%
6	Easy access to health facilities	50.0%
7	Easy access to village/district offices	42.6%



Overall, investments in electricity provision and road construction in Huntap not only strengthen infrastructure but also enrich the lives of residents, proving that focused and planned infrastructure development can affect profound and sustainable social and economic change.

## 2) Benefits of Settlement Infrastructure Development

In this section, we will discuss the benefits of residential infrastructure development, especially in Permanent Housing (Huntap) settlements. The discussion will cover the various infrastructures that have been developed and how they have a positive impact on residents.

**Table 29. Benefits of Settlement Infrastructure Development in Huntap Settlements**

No	Types of Infrastructure	Survey Results (%)
1	RTH/RTP	97.1%
2	Drainage System	98.7%
3	Waste Systems	94.9%
4	Integrated Domestic Wastewater Management System	100%
5	Public street lighting	97.6%
6	Soil retaining wall (DPT)	97.9%

### a. RTH/RTP

In order to enrich the environment of Permanent Housing (Huntap) settlements and provide direct benefits to their residents, the construction of Green Open Space (RTH) and Public Open Space (RTP) has been carried out as a key initiative. Based on the data, survey respondents have provided positive feedback on the significant impact felt from the integration of these open spaces into their residential spatial planning.

The benefits felt by respondents were:

1. Enjoying easy access to entertainment provided by RTH/RTP, reflects the reduced need to find recreational locations outside of settlements. This shows how important it is to have recreational facilities within easy reach for residents, supporting their mental and physical well-being.
2. The play facilities for children at RTH/RTP were also highly appreciated by respondents by stating that this space allows families with children to enjoy their free time without having to go far from home. This not only makes it easier for parents to supervise children but also strengthens social bonds among children in the community.
3. The development of RTH/RTP also has an impact on reducing the frequency of visits to shopping centers. These facilities offer an alternative to activities typically carried out in shopping malls, such as local markets or community activities, which integrate more social and economic activities within the settlement.
4. Another benefit felt was the ease of access to sports, respondents felt no longer needed

to rent a place for physical activity, showing how RTH/RTP can facilitate healthy living.

5. In addition, respondents found that hosting communal events became more efficient and cost-effective, given the availability of adequate and affordable space in their own environment.
6. Another important aspect is the improvement of aesthetics and environmental comfort, which is perceived by respondents. The existence of RTH/RTP not only beautifies the area but also improves air quality and offers a pleasant place to relax and interact with neighbors, strengthening the sense of community and togetherness.

Overall, the integration of Green Open Space/Public Open Space has brought a positive transformation into the Huntap settlement, showing that planning that takes into account social and environmental needs can enrich people's lives at large.

### **b. Drainage System**

In the context of rehabilitation and improvement of Huntap settlement infrastructure, the development of drainage systems has become one of the critical components that has a significant positive impact on the quality of life and the settlement environment. The survey results provide a clear picture of the substantial benefits resulting from the program.



The benefits felt by respondents were:

1. With the new drainage system, waterlogging and flood potential have been significantly reduced, keeping their environment dry and safer from flood risks. This is an important improvement, given the negative impact that flooding can have on property and occupant safety.
2. Respondents felt the direct benefits of the drainage system in preventing damage to road infrastructure. Well-maintained roads not only improve accessibility but also extend the life of such infrastructure, which overall reduces long-term maintenance costs.
3. The construction of drainage systems also contributes to the creation of healthier environments, where respondents enjoy the benefits of reducing stagnant water that has the potential to breed disease.
4. Improved environmental cleanliness was also felt by respondents, which showed the efficiency of the system in maintaining the cleanliness of settlements.



5. Regarding the reliability of the system, respondents felt that the waterways were no longer clogged, indicating that the design and maintenance of the drainage system was functioning effectively. It emphasizes the importance of careful planning and proper execution in infrastructure projects.
6. The installation of duct caps has also reduced physical hazards, such as falls or trips, perceived by respondents, showing concern for safety aspects in system design.
7. The increased water flow felt by respondents also showed that the system successfully eliminated the problem of water accumulation, which is often a major source of problems in residential environments

The implementation of the drainage system in the Huntap settlement not only addresses immediately visible infrastructure problems but also brings profound changes to the aspects of safety, health, and environmental sustainability of the settlement. The results of this survey reinforce that investments in the right infrastructure can have a transformational impact on communities, bringing about sustainable positive change in the daily lives of residents.

### **c. Waste Systems**

The construction of a waste system in the Huntap settlement has had a significant impact on improving environmental cleanliness and health. The results of the survey show that the majority of residents feel positive changes since the implementation of this system.

The benefits felt by respondents were:

1. Respondents felt that their environment no longer smelled bad, which indicates a significant reduction in olfactory pollution thanks to a more effective waste management system.
2. In addition, respondents enjoyed the convenience of disposing of waste due to the closer disposal location, which minimizes the effort and time required to manage household waste.
3. The cleanliness aspect was felt by respondents that the environment became cleaner, indicating a decrease in scattered garbage that can attract pests and spread diseases.
4. Health factors were a major concern, with respondents observing a healthier environment since the new system was implemented, although these figures suggest that there is still room for improvement in terms of the immediate health effects of waste systems.
5. The increase in the frequency of garbage transport, which was felt by respondents, confirms a more regular and systematic effort in managing waste, which is essential for maintaining cleanliness and public health.

This can indicate that the development of an efficient waste system is an important step in promoting a better quality of life through a cleaner and healthier environment. It not only

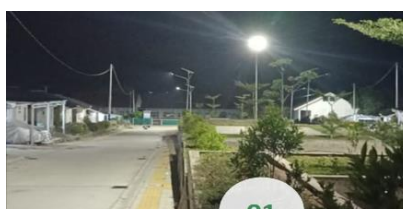
improves the cleanliness of the environment but also actively contributes to the well-being and health of the community, which shows the success of this infrastructure project in Huntap.

#### d. SPAL-DT, PJU (Public Street Lighting) and DPT (Ground Retaining Wall) Facilities

Infrastructure development in the Huntap settlement has involved the implementation of vital facilities such as SPAL-DT, PJU, and DPT, all of which have contributed greatly to improving environmental conditions and the safety of residents. The survey results illustrate that each element of this infrastructure brings significant benefits.

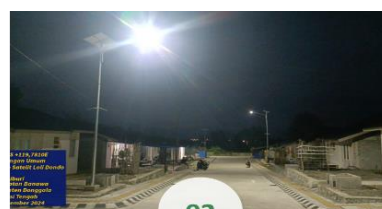
The benefits felt by respondents were:

1. Respondents felt that the development of the Integrated Domestic Wastewater Management System (SPAL-DT) helped maintain a healthy and clean environment. In addition, this system is also effective in reducing the risk of contamination and diseases arising from inadequate waste management.
2. Furthermore, Public Street Lighting (PJU) was declared very useful by respondents. These facilities not only improve safety by reducing accidents and crimes at night but also add to the aesthetic value of the environment, making the settlement more comfortable and safe at night.
1. The Soil Retaining Wall (DPT), which was considered positive by respondents, where DPT has become a crucial infrastructure in preventing erosion and landslides, especially in vulnerable areas such as Huntap. The stability provided by DPT is essential to protect property and residents' lives from the threat of natural disasters.



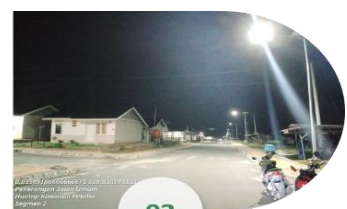
01

Huntap Sibalaya Selatan



02

Huntap Loli dono



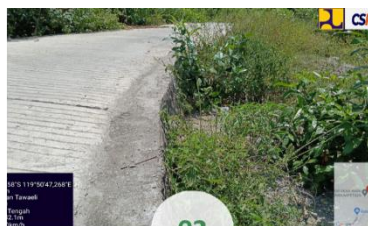
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Huntap Petobo



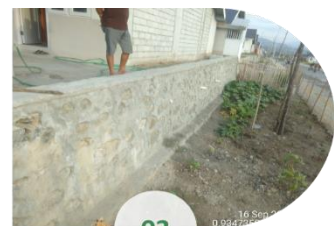
01

Huntap Petobo Segmen 1



02

Wani Segmen 2



03

Huntap Petobo Segmen 3

Overall, this data reinforces that the provision of SPAL-DT, PJU, and DPT facilities is an important component in infrastructure development that not only improves the quality of

life but also supports environmental sustainability in Huntap settlements.

### 3) Benefits of Settlement Infrastructure Development in Livelihood Aspects

One important component in improving the quality of life in Huntap settlements is improving access to health facilities. The table "**Benefits of Housing Access Development to Health Facilities**" reveals the positive impact of the construction of roads and other access infrastructure that connects housing with health service centers. Survey results show that most respondents experienced significant improvements in access to primary and secondary health services, reflecting the project's success in integrating community health needs into urban planning.

From the data collected, 94.3% of respondents reported that they felt easier access to health centers, which is a critical point for day-to-day health services and management of common health problems. This improved access makes it easier for residents to seek treatment and motivates them to have regular health check-ups, which can prevent long-term health complications.

In addition, 84.8% of respondents stated that access to hospitals has become easier, a vital improvement for emergency situations and treatment of more complex medical conditions. This convenience is especially important in cases that require quick treatment to reduce the risk of complications or death.

Interestingly, the response to the ease of utilizing these services was also very positive. A total of 97.1% of respondents found it easier to utilize Puskesmas services and 96.8% stated the same for hospitals. The fact that these services are not only more accessible but also easier to utilize shows the success in integration and the effectiveness of infrastructure planning.

**Table 30. Benefits of Development of Housing Access to Health Facilities**

No.	Benefit Type	Survey Results (%)
1	<b>Health Center</b>	
a	Easier access	94.3%
b	Easy to utilize	97.1%
2	<b>Hospital</b>	
a	Easier access	84.8%
b	Easy to utilize	96.8%

The construction of effective housing access to health facilities in Huntap settlements has played an important role in strengthening the foundations of community health. This initiative has demonstrated how well-thought-out and integrated infrastructure can significantly improve residents' daily lives, strengthen public health services, and support a long-term commitment to community health and well-being.

The development of effective housing access to education facilities in Huntap settlements has provided significant benefits which are recorded in the Table "**Benefits of Housing Access Development to Education Facilities**". The survey shows that almost all

respondents (96.1% to 99.6%) reported increased and easier access to various educational institutions ranging from early childhood education to high school. This improved access not only eases children's daily commute to school, but also increases student attendance and participation, which is crucial for their academic achievement.



Furthermore, 65.3% of respondents felt that these schools are now more viable and convenient places for their family or household members to obtain education. This indicates that improvements in infrastructure and accessibility have enriched the learning experience, making the educational environment more attractive and supportive for students. Another important addition is that 33.8% of respondents identified education facilities as one of the main places to work or earn a living, indicating the importance of these schools as learning centers and employers in the community.

**Table 31. Benefits of Housing Access Development to Education Facilities**

No.	Benefit Type	Survey Results (%)
1	<b>Easier access</b>	
a	PRESCHOOL/KINDERGARTEN:	99.6%
b	SD	99.6%
c	SMP	97.5%
d	SMU	96.1%
2	<b>Where family members/household members (children) receive education</b>	65.3%
3	<b>One of the places to work/earn a living/do business</b>	33.8%

These benefits suggest that investment in the construction of access housing that connects directly to education facilities substantially contributes to education enrollment rates, local economic development, and quality of life in the Huntap. Better access to education is followed by increased employment opportunities and better learning conditions, underscores the importance of integrated infrastructure in supporting holistic community well-being.

The construction of housing access in Huntap settlements has significantly impacted residents' connectivity with various economic facilities, especially markets and workplaces. Based on data from the Table "**Benefits of Housing Access Development to Economic Facilities**," 96.5% of respondents stated that the construction of this access made it easier for them to reach places of work or business. This shows that the road and access infrastructure that has been built has made a real contribution to the community's economic mobility. This improved access facilitates labour movement, cuts travel time, and lowers worker transportation costs, increasing productivity and family economic

welfare.

Furthermore, 97.9% of respondents felt that access to markets had become easier. Better access to markets means that residents can more quickly sell their agricultural produce, household products or other merchandise. This also makes it easier for families to get their daily needs more quickly and efficiently, saving time and reducing costs associated with transportation or logistics.

**Table 32. Benefits of Housing Access Development to Economic Facilities**

No.	Benefit Type	Survey Results (%)
1	Easy access to the place of work/business	96.5%
2	Easy access to the Market	97.9%

This survey data reflects that the development of housing access infrastructure to economic facilities has succeeded in integrating communities with centres of economic activity, increasing economic efficiency and productivity, and positively impacting the quality of life in Huntap. The availability of better access not only facilitates workers but also strengthens the local economic ecosystem that develops along with infrastructure improvements.

The development of good housing access in Huntap settlements has significantly impacted residents' ease of access to vital public services. Based on data from the Table "**Benefits of Housing Access Development on Public Services**", as many as 99.1% of respondents feel easier access to the village or kelurahan office, which shows that the infrastructure built has made it easier for people to take care of administration and public services in their area.

In addition, 96.7% of respondents stated that the construction of this access also made it easier to travel to the kecamatan office. This is particularly important for those who require more complex services, such as official documents or other administrative needs that can only be served at the kecamatan level.

Furthermore, 99.3% of respondents appreciated the ease of access to places of worship, which are critical to the spiritual and social life of the community. Improved access to places of worship supports a more active religious life and facilitates communal activities in the Huntap.

**Table 33. Benefits of Housing Access Development to Public Services**

No.	Benefit Type	Survey Results (%)
1	Easier access to village offices	99.1%
2	Easier access to sub-district office	96.7%
3	Easier access to Places of Worship	99.3%

This shows that the development of access housing has successfully improved the accessibility of Huntap residents to various important public services. The infrastructure built has connected them to vital facilities more efficiently, helping to improve their well-being and ease of daily life.

Security in this case is security in asset ownership, namely Huntap assets, because it is one



of the important aspects of settlement life, and the development of good housing access has provided great benefits in increasing the sense of security for residents of Huntap settlements in terms of ownership status. Based on the data in the Table "**Benefits of Housing Access Development on Settlement Security**", as many as 99.2% of respondents feel certainty regarding the status of their residential ownership rights, including land ownership. This shows that infrastructure development initiatives not only include physical improvements but also provide legal certainty that it is important for residents to feel calm about the future of their housing.

In addition, the same data also shows that 99.2% of respondents feel confident with guarantees or certainty regarding the status of ownership rights to the Permanent Housing (Huntap) they occupy. This certainty provides a significant sense of security and contributes to the social and psychological stability of residents, as they no longer face uncertainty regarding ownership rights or potential land disputes in the future.

**Table 34. Benefits of Housing Access Development on Residential Security**

No.	Benefit Type	Survey Results (%)
1	Have residential ownership rights (including land)	99.2%
2	Guarantee / certainty of the status of 'ownership rights' to the shelters	99.2%

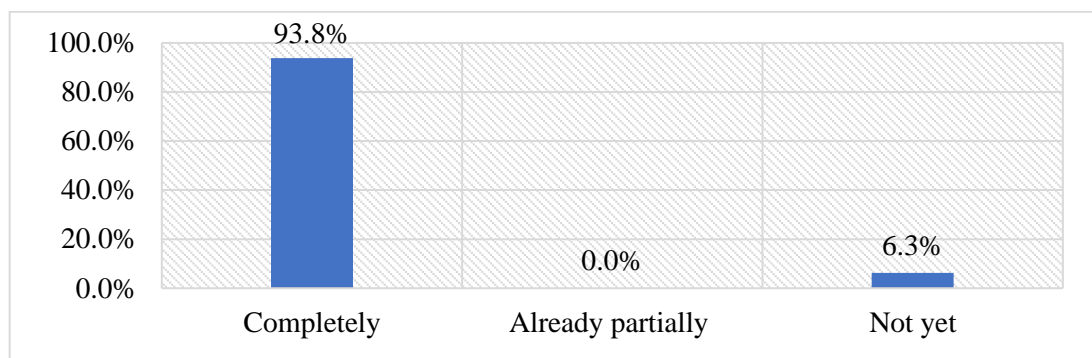
Based on this survey, it confirms that the development of housing access integrated with certainty of ownership rights has had a positive impact in creating a safer and more secure living environment. This benefit is very important for building a stable and sustainable community in Huntap.

#### 4.2.2. Benefits of Public Facilities

The results and description of the benefits of public facilities for health facilities are seen from how many people are served by health facilities, and for education facilities, they are seen from how many people / students are served by education facilities.

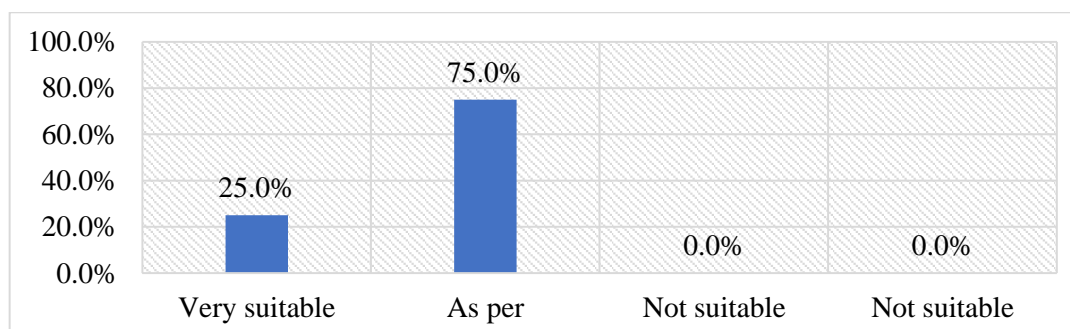
##### 1) Benefits of Basic Education Facilities

The survey results illustrate the importance of resilient reconstruction and strengthening of public facilities, particularly in the context of basic education facilities. Based on the data presented, it appears that most managers, teachers and employees in education facilities (93.8%) have fully or partially implemented earthquake-resistant construction designs. Only 6.3% of the respondents have not yet implemented this design, indicating a fairly high level of adoption in an effort to improve infrastructure resilience to earthquake disasters.



**Figure 38. Perceptions of Manager/Staff Respondents Regarding the Application of Earthquake Resistant Design in the Construction of Basic Education Facilities**

Furthermore, the evaluation of the suitability of the earthquake-resistant design application showed that 75% of the respondents felt that it was very suitable for their needs and conditions. In comparison, 25% stated that it was suitable. This indicates a widespread recognition of the effectiveness of earthquake-resistant design in protecting facilities and their occupants.

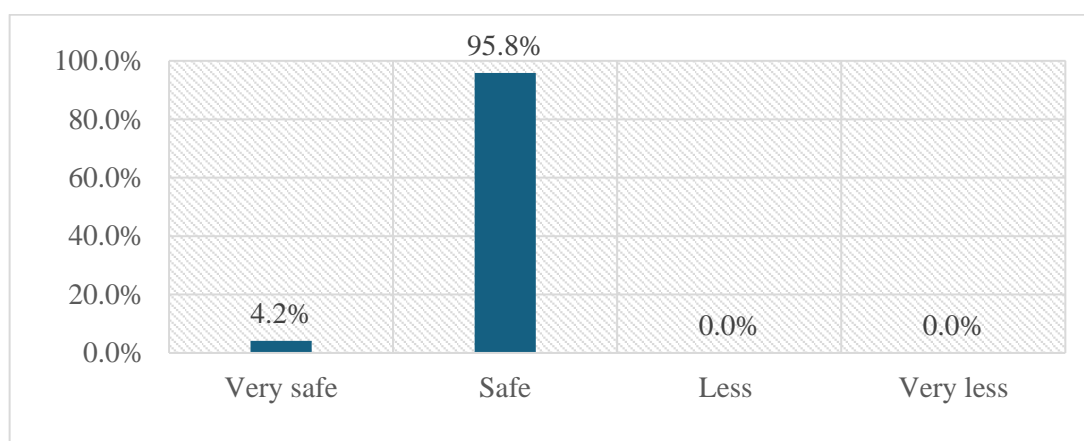


**Figure 39. Perceptions of Manager/Staff Respondents Regarding the Appropriateness of the Application of Earthquake Resistant Design in the Construction of Basic Education Facilities**



In terms of students and parents, confidence in the safety of the building is also very high. A total of 95.8% of students or guardians felt that their school buildings were safe, with an additional 4.2% who felt very safe. This shows that the efforts to reconstruct and strengthen the facilities have succeeded in fostering a sense of security among the users of these facilities.





**Figure 40. Perceptions of student guardian respondents regarding the level of safety and security of primary education facilities**

This emphasizes the importance of continuing and expanding these resilient reconstruction initiatives to more educational facilities, especially in earthquake-prone areas. The evidence presented in the slides can be used as a strong argument in the report to support policies and funding allocations that focus on improving safety through more resilient design and construction.

In addition, the construction of basic education facilities in Huntap settlements has provided tremendous benefits, as expressed by managers, teachers, and employees involved in education in the area. The survey results revealed in the Table "**Benefits of Basic Education Facility Development Based on Manager/Teacher/Employee Respondents**" show that all respondents agreed on the positive impact of the construction of this facility.

In terms of tangibility, 100% of respondents stated that the education facilities built are easily accessible to students and educators. This shows that the infrastructure has improved accessibility to education, thereby reducing physical barriers that may have previously been an obstacle for communities in obtaining proper education. In addition, these facilities fully support students' learning needs, with service capacity restored and even improved.

The additional capacity of school services was also recognized by all respondents as a significant improvement, contributing to better and more efficient education services. This is in line with the restoration of facility capacity, which provides greater space to accommodate students and provide more adequate education services.

In terms of intangibles, 100% of respondents also stated that the construction of these facilities supports a sense of security and comfort in the educational environment. The facilities built provide proper learning spaces and create an environment conducive to the teaching and learning process. With better facilities, students and educators feel safer and more comfortable, ultimately improves the quality of education in Huntap.

**Table 35. Benefits of Basic Education Facility Development Based on Manager/Teacher/Employee Respondents**

No.	Benefit Type	Survey Results (%)
<b>A</b>	<b>Tangible</b>	
1	Easy to reach	100%
2	Meet and support learning needs	100%
3	Capacity of education facilities restored	100%
4	Additional school service capacity	100%
5	Improved school services	100%
<b>B</b>	<b>Intangible</b>	
1	Support a sense of security	100%
2	Supports a sense of comfort	100%

Overall, the construction of basic education facilities in Huntap has successfully strengthened the foundation of education in the area, providing better access, wider services, and a safe and comfortable learning environment for all parties involved.

The construction of basic education facilities in Huntap settlements has positively impacted students and their families. Based on the survey results summarized in Table "**Benefits of Basic Education Facility Construction Based on Student Respondents/Represented Parents of Students**", as many as 95.8% of respondents stated that the construction of these facilities directly supported their children's educational needs. The facilities provide a place to learn and improve the quality of education services, as reported by 100% of respondents who perceived improvements in school services.

The existence of special facilities for students with disabilities was also appreciated by 100% of respondents. This shows that the educational facilities are inclusive and able to meet the needs of all students, without exception. In addition, the additional capacity of school services was also perceived by 91.7% of respondents, showing how these facilities are able to accommodate more students and serve a wider community.

Furthermore, 100% of respondents felt that the newly constructed buildings and learning spaces provided their children a sense of security and comfort. This is very important in creating a conducive learning environment that is physically safe and psychologically comfortable, thus supporting the overall teaching and learning process.

**Table 36. Benefits of Basic Education Facilities Development Based on Student Respondents/Represented Parents of Students**

No.	Benefit Type	Survey Results (%)
<b>A</b>	<b>Tangible</b>	
1	Support schooling needs	95.8%
2	Improved school services	100%
3	Usability of disability-specific facilities	100%
4	Increased school service capacity	91.7%
5	School services are getting better	100%

No.	Benefit Type	Survey Results (%)
<b>B</b>	<b>Intangible</b>	
1	Buildings and learning spaces are safe and comfortable	100%
2	Safe from building safety	100%
3	Building gives a sense of comfort	100%

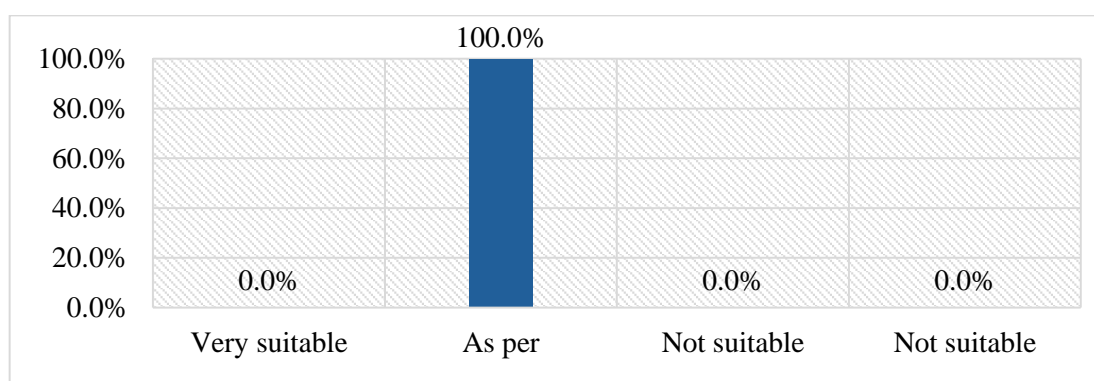
In general, the development of basic education facilities in Huntap has succeeded in creating significant positive impacts for students and their parents. Increased access, capacity and quality of education services accompanied by attention to the needs of students with disabilities show that this development has run according to expectations and made a real contribution to the future of education in Huntap settlements.

## 2) Health Facility Benefits



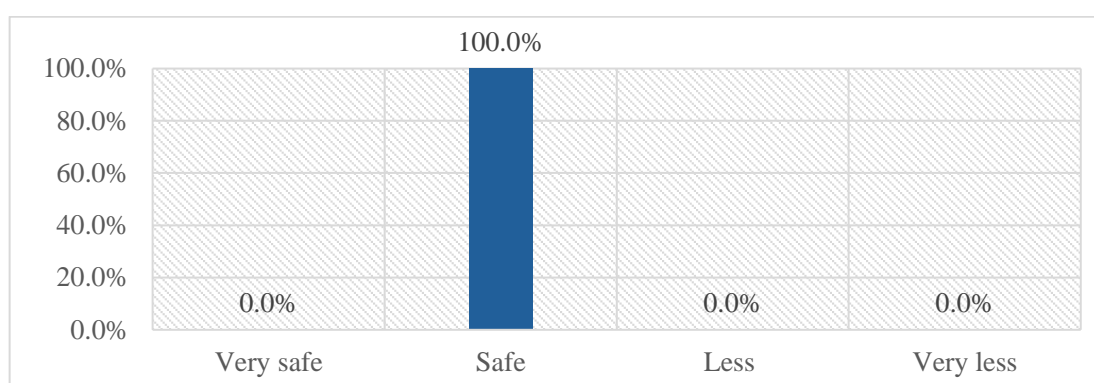
A survey of health facility managers, employees and patients revealed strong positive perceptions regarding the implementation of earthquake-resistant design and building safety. Most managers and employees felt that the implementation of earthquake-resistant design was effective, with many respondents agreeing

or strongly agreeing that the construction could provide adequate protection from potential earthquake damage.



**Figure 41. Perceptions of Manager/Employee Respondents Regarding the Application of Earthquake Resistant Design in Health Facility Construction**

Meanwhile, from the patient side, perceptions of building security and safety were also high, with the majority feeling safe or very safe when using the facility. This indicates that the security standards that have been implemented are effective in fostering trust and a sense of security among health facility users.



**Figure 42. Patient Respondents' Perception of the Level of Security and Safety of Health Facility Buildings**

Broadly speaking, the survey also indicated that there is still room for improvement, especially in providing further information and education on the security features that have been integrated into the facilities and safety protocols to ensure facility users' understanding and preparedness for potential earthquake risks.

In terms of **Benefits The development of health facilities in Huntap settlements** has significantly impacted the availability of health services. Surveys from respondents consisting of managers, doctors, and nurses revealed various tangible and intangible benefits. A total of 100% of respondents stated that the new health facilities are easy to reach, which is very important for community accessibility.

While these facilities have improved the services provided by hospitals and health centers, as perceived by 50% of respondents, the capacity of the services has only improved in 50% of respondents. This suggests that despite the improvements, some of the health facilities still require further development to fully meet community demand.

On the intangible aspect, only 37.5% of respondents felt that the facility supported security, but 100% felt that the space and work environment in the health facility provided a sense of comfort. This comfort is important in supporting a conducive work environment for health workers.

**Table 37. Benefits of Health Facility Development Based on Manager/Doctor/Nurse Respondents**

No.	Benefit Type	Survey Results (%)
<b>A</b>	<b>Tangible</b>	
1	Easy to reach	100%
2	Increased capacity to provide services	50%
3	Improving hospital/community health center services	50%
<b>B</b>	<b>Intangible</b>	
1	Lack of security support	37.5%
2	The room gives a sense of comfort	100%

In general, regarding the benefits of health facility development based on Manager/Doctor/Nurse respondents, this data highlights that the construction of health

facilities in Huntap has provided significant benefits, especially in terms of accessibility and convenience, but there are still challenges in increasing service capacity and security that need to be addressed to ensure more comprehensive health services for the community.

The construction of health facilities in Huntap settlements has provided various benefits that patients and their families feel directly. Based on the survey in Table **"Benefits of Health Facility Development Based on Patient/Family Respondents"**, as many as 50% of respondents stated that the facility supported their care and treatment needs. This shows that despite improved access, there is still room for further development to optimally meet care needs.

However, all respondents (100%) appreciated the existence of specialized facilities for people with disabilities. These facilities provide inclusive access and ensure that all community members, without exception, can utilize health services fairly and equally.

In addition, 50% of respondents felt that the capacity of hospitals and health centers had increased, indicating an improved ability of the health services to accommodate more patients and provide more efficient care. This contributes to improved service quality, which was also appreciated by all respondents (100%), indicating that the service experience at the hospital or puskesmas is now much better after the development.

In terms of intangibles, 91.7% of respondents stated that the health facility gave them a sense of security, both in terms of the building facilities and the care received. In addition, 100% of respondents felt that the health facility building also guarantees safety, indicating that the building structure has been designed with high safety factors in mind. The comfort felt by all respondents (100%) is also one of the main indicators of the success of the construction of health facilities in Huntap.

**Table 38. Benefits of Health Facility Development Based on Patient/Family Patient Respondents**

No.	Benefit Type	Survey Results (%)
A`	<b>Tangible</b>	
1	Support Medication Care Needs	50%
2	Special Disability Facilities Benefit	100%
3	Hospital/Community Health Center Capacity Increases	50%
4	Improving hospital/community health center services	100%
B	<b>Intangible</b>	
1	Provide a sense of security	91.7%
2	A sense of security and building safety	100%
3	Cozy	100%

In general, regarding the benefits of health facility development based on Patient/Family of Patient respondents, the construction of health facilities in Huntap settlements increases service capacity and provides a sense of security and comfort

for patients and their families. The existence of these inclusive and comfortable facilities shows a positive impact on the quality of public health in Huntap settlements.

### 4.3. Project Efficiency and Economic Analysis

**CSRRP investment as a whole is efficient, feasible and beneficial.** As of October 11, 2024, CSRRP has financed 3 financing components amounting to 91% of the total allocation of US\$150 million, namely; 1) financing for the development of permanent housing and residential infrastructure (61.4%/92%), 2) financing for the rehabilitation and reconstruction of public facilities (27.3%/91%), and 3) financing to support project implementation (11.3%/83%).

Overall CSRRP investment is Efficient, Feasible and Useful, Project Efficiency Analysis (US\$150 million), carried out against the actual cost of US\$ 135,837,791.24 (91%) from the allocated cost), projected 17 years, Discount Rate 10%

- a. Component-1 Investment: US\$ 83,405,080.42
- b. Component-2 Investment: US\$ 37,137,986.95
- c. Component 3: US\$ 15,294,723.86
- d. Total Investment + OM: US\$ 2,240,760,997
- e. Total Benefit: US\$ 6,848,283,525
- f. Total Net Benefit: US\$ 4,607,522,528

**The leverage capacity of the project assistance fund is 11%.** The leverage capacity is 11%, meaning that US\$1 of aid/loan funds brings US\$0.11 of partnership funds sourced from the Government, Local Governments and Communities in the form of land provision.

Using a *discount rate* of 10%, the NPV of the Project is US\$ 747,017,330 with an EIRR of 28%, the NPV of component 1 is US\$ 100,679,022 with an EIRR of 19%, the NPV of Component 2 is US\$ 656,183,306 with an EIRR of 34%, for Housing and Residential Infrastructure the NPV is US\$ 92,321,058 with an EIRR of 18%, for Health Facilities the NPV is US\$ 322,056,632 and EIRR is 67% while the NPV of education facilities is US\$ 305,577,258 with an EIRR of 32%.

**Table 39. Summary of NPV and EIR of the Project, Component 1 and Component 2**

	Project	Component 1	Component 2
<b>NPV (US\$)</b>	<b>747,017,330</b>	<b>100,679,022</b>	<b>656,183,306</b>
<b>EIRR</b>	<b>28%</b>	<b>19%</b>	<b>34%</b>

**Table 40. Summary of NPV and EIRR of Housing, Health Facilities, Education Facilities, and Other Public Facilities**

	Housing & Infra Settlement	Health Facilities	Education Facilities	Other Public Facilities
<b>NPV (US\$)</b>	92,321,058	322,056,632	305,577,258	28,549,416

<b>EIRR</b>	<b>18%</b>	<b>67%</b>	<b>32%</b>	<b>15%</b>
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1. **NPV and EIRR Component 1. Investing in Component 1 is efficient, feasible and beneficial.** CSRRP has built 3,880 residential units in new locations and residential infrastructure both inside and outside the shelter. The total investment cost of housing, settlement infrastructure and *community grants*, plus the projected cost of operation and maintenance for 11 years (calculated from 2025 to 2035) is US\$ 953,253,927, the total benefits obtained are US\$ 1,757,342,195, and the net benefit is US\$ 804,088,268. Benefit-to-expense ratio of 1.84 (>1), NPV of US\$100,679,022 (positive), EIRR of 19% (>10%).
  - a. **NPV and EIRR of Residential & Residential Infrastructure.** *Investment in housing and settlement infrastructure is efficient, feasible and useful.* The total investment cost of housing and settlement infrastructure, plus the projected cost of operation and maintenance for 11 years (calculated from 2025 to 2035) is US\$909,174,986, the total benefits obtained are US\$1,674,836,881, the net benefit is US\$765,661,895. Benefit and expense ratio of 1.84 (>1), NPV of US\$92,321,058 (positive), EIRR of 18% (>10%).
  - b. **NPV and EIRR for Clean/Drinking Water Infrastructure.** *Investment in clean water infrastructure is efficient, feasible and beneficial.* The total investment cost of housing and settlement infrastructure, plus the projected cost of operation and maintenance for 11 years (calculated from 2025 to 2035) is US\$17,478,717, the total benefit obtained is US\$31,465,992, the net benefit is US\$13,987,275. Benefit-to-expense ratio of 1.80 (>1), NPV of US\$2,659,000 (positive), EIRR of 20% (>10%).
  - c. **NPV and EIRR of other Settlement Infrastructure.** *Investment in other settlement infrastructure is efficient, feasible and beneficial.* The total investment cost of housing and settlement infrastructure, plus the projected cost of operation and maintenance for 11 years (calculated from 2025 to 2035) is US\$17,951,474, the total benefits obtained are US\$32,125,781, the net benefit is US\$14,174,307. Benefit-to-expense ratio of 1.79 (>1), NPV of US\$2,983,057 (positive), EIRR of 23% (>10%).
  - d. **NPV and EIRR Community Grant.** *Community Grant investment is efficient, feasible and beneficial.* The total investment cost of *community grants* and maintenance for 11 years (calculated from 2025 to 2035) is US\$ 8,416,872, the benefits obtained are US\$ 18,913,541, and the net benefits are US\$ 10,496,669. Benefit and expense ratio of 2.25 (>1), NPV of US\$2,874,282 (positive), EIRR of 36% (>10%).



**2. NPV and EIRR Component 2. Investing in Component 2 is efficient, feasible, and beneficial.** CSRRP has rehabilitated and reconstructed public facilities in the form of educational facilities, health facilities and other public facilities in the form of office buildings. The realization of financing for component 2 is US\$37,137,986.95, which consists of rehabilitation and reconstruction costs for educational facilities of US\$20,307,746.26, health facilities of US\$5,100,415.15, and other public facilities of US\$11,729,825.55. The total investment value of rehabilitation and reconstruction of public facilities plus the projected cost of operation and maintenance for 11 years (calculated from 2025 to 2035) is US\$ 1,272,212,346, the total benefit is estimated at US\$ 5,090,941,330. Its benefit and expense ratio is 4.00 (>1), NPV is US\$656,183,306, EIRR is 34% (>10%).

- a. **NPV and EIRR of Educational Facilities.** The total investment value of rehabilitation and reconstruction of educational facilities plus the projected cost of operation and maintenance for 11 years (calculated from 2025) is US\$677,263,338, the total benefit is estimated at US\$2,495,090,951, the net benefit is US\$1,817,827,613. Its benefit and expense ratio is 3.68 (>1), NPV is US\$305,577,258, EIRR is 32% (>10%). *Investment in rehabilitation and reconstruction of CSRRP education facilities is efficient, feasible, and beneficial.*
- b. **NPV and EIRR of Health Facilities.** The total investment value of rehabilitation and reconstruction of health facilities plus the projected cost of operation and maintenance for 11 years (calculated from 2025) is US\$180,299,675, the total benefit is estimated at US\$1,860,146,399, the net benefit is US\$1,679,846,723. Benefit and expense ratio of 10.32 (>1), NPV of US\$322,056,632 (positive), EIRR of 67% (>10%). *Financing the rehabilitation and reconstruction of CSRRP health facilities is efficient, feasible and useful.*
- c. **NPV and EIRR of Other Public Facilities.** The total value of investment in rehabilitation and reconstruction of other public facilities plus the projected cost of operation and maintenance for 11 years (calculated from 2025) is US\$414,649,333, the total benefit is US\$735,703,981, and the net benefit obtained is US\$321,054,648. Cost-benefit ratio of 1.77 (>1), NPV of US\$28,549,416, EIRR of 15% (>10%). *Financing for rehabilitation and reconstruction of other public facilities built by CSRRP is efficient, feasible and useful.*

**The leverage capacity of the project assistance fund is 11%.** The leverage capacity is 11%, meaning that US\$1 of aid/loan funds brings US\$0.11 of partnership funds sourced from the Government, Local Governments and Communities in the form of land provision. In the CSRRP project financing plan, there is no estimate and draft partnership cost to carry out all the components of the planned activities. In its implementation, there are other resources sourced from the government, local governments, and communities in the form of land with a

value of around US\$15.50 million, or around 34% of the cost sourced from loans for residential construction, 19% against the cost of Component 1 loans, and 11% of the overall project loan costs. This contribution to the provision of land allows the project to run.

#### A. Efficiency of Type-1 Infrastructure Type

This section presents a comparative analysis of cost efficiency in the development of Permanent Housing (Huntap) settlement infrastructure with data cuts as of October 31, 2024. Cost efficiency is calculated based on the difference between the Engineering Estimate (EE) calculation and the actual contract cost.

**Table 41. Calculation of Engineering Estimate (EE) with Construction Costs according to Contracts Based on Type 1 Infrastructure Type**

	UNIT	EE PRICE (Rp/Unit)	CONTRACT PRICE (Rp/Unit)	% Efficiency
1.	RISHA House T.36	136,700,106.71	103,665,755.15	24%
2.	RISHA Home + Persil PSU	153,229,889.58	120,764,559.88	21%
3.	RISHA House + Persil PSU + Huntap Settlement Infrastructure	323,742,628.40	252,222,904.11	22%

Cost efficiency for RISHA House units is described in three scenarios: house units only, houses with persil PSUs, and houses with persil PSUs plus other infrastructure. Cost efficiency for house units alone reached 24%, while houses with PSU per sit reached 21%, and a combination of houses, PSU persil and other infrastructure recorded an efficiency of 22%.

#### B. Efisiensi Jenis Infrastruktur Tipe-2

Bagian ini lebih lanjut menjelaskan efisiensi biaya untuk infrastruktur permukiman pada kawasan Hunian Tetap Tondo-2, dengan pembagian rinci pada komponen seperti jalan (aspal), drainase (U-Ditch), dinding penahan tanah, dan lain-lain. Efisiensi tertinggi dicatat pada ruang terbuka hijau dengan 42%, sementara pencahayaan jalan umum menunjukkan efisiensi sebesar -2%, yang berarti biaya aktual lebih tinggi dari estimasi awal. Pembangunan infrastruktur lain seperti SPAM, distribusi air, dan pengolahan air limbah juga ditampilkan dengan persentase efisiensi masing-masing.

**Table 42. Calculation of Engineering Estimate (EE) with Construction Costs according to Contracts Based on Type-2 Infrastructure Types**

	UNIT	EE PRICE (Rp/Unit)	CONTRACT PRICE(Rp/Unit)	% Efficiency
1.	RISHA House + Persil PSU (per Unit)	153,229,889.58	120,764,559.88	21%
2.	Huntap Settlement Infrastructure (per Huntap Area)	184,453,608,106.33	144,538,977,307.19	22%
	A. Road infrastructure (asphalt)	47,179,863,462.44	37,019,112,783	22%

UNIT	EE PRICE (Rp/Unit)	CONTRACT PRICE(Rp/Unit)	% Efficiency
B. Drainase (u-ditch)	47,430,882,324	38,511,260,103	19%
C. Retaining soil wall	24,464,341,126	18,831,953,958	23%
D. Public street lighting (pju)	5,886,070,127	6,028,703,077	-2%
E. Green open space	5,683,077,247	3,298,811,961	42%
F. Spam development: reservoirs, distribution networks, sr	12,387,699,416	10,094,567,164	19%
G. Spald-t construction: network, processing building, sr	33,696,322,774.45	24,710,627,219.30	27%
H. Construction of TPS-3R: buildings, collection/processing equipment	3,913,226,139	3,198,051,061	18%
I. Construction of multipurpose buildings	3,812,125,491	2,845,889,980	25%

Note:

1. The price per type of Settlement Infrastructure is the price in one Huntap Tondo-2 area;
2. The price of SPAM (f) includes the cost of Drinking Water SR and SPALD-T (g) includes Wastewater SR (Black Water/Grey Water);

### C. Efficiency of Public Facility Work Package

In this section, investment efficiency for construction and rehabilitation projects of public facilities until October 31, 2024, it is known that the cost efficiency achieved varies between projects. The Rehabilitation and Reconstruction of the Central Sulawesi High Prosecutor's Office recorded the highest efficiency of 34%, indicating very efficient management and procurement. Meanwhile, other projects such as the Rehabilitation and Reconstruction of Basic Education Facilities have achieved only 10% efficiency, which may indicate the existence of technical challenges or specific needs that increase costs. Overall, the public works package recorded a combined efficiency of 24%, demonstrating the project's ability to save costs relative to the initial estimate, noting that the Engineering Estimate price includes an overhead of 11%. This data provides important insights into the allocation and saving of public funds in national infrastructure development.

**Table 43. Calculation of Engineering Estimate (EE) with Construction Costs according to the Contract Based on Public Facility Work Package**

UNIT	EE PRICE (Rp/Unit)	CONTRACT PRICE(Rp/Unit)	% Efficiency
<b>PUBLIC FACILITY WORK PACKAGE</b>	<b>562,887,870,103.02</b>	<b>428,496,390,000.00</b>	<b>24%</b>
a. <i>Rehabilitation and Reconstruction of Education Facilities in Universitas Tadulako Phase II</i>	310,770,343,333.02	244,734,806,000	21%
b. <i>Rehabilitation and Reconstruction of Office Building of Kejaksaan Tinggi Sulawesi Tengah</i>	163,526,931,600.00	107,119,311,000	34%
c. <i>Rehabilitation and Reconstruction of Hospital of Undata Phase II-B</i>	66,391,396,590.00	56,769,731,000	14%
d. <i>Rehabilitation and Reconstruction of Elementary Education Facilities</i>	22,199,198,580.00	19,872,542,000	10%

#### 4.4. Achievement of End-of-Program Targets

This section comprehensively describes the achievement of the final targets of the Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP). These achievements cover various aspects of infrastructure, public facilities, and basic services to improve the quality of life of affected communities. Through a thorough evaluation of key performance indicators, this chapter will assess the extent to which the program has achieved its objectives, the factors contributing to its success, and the challenges faced during the implementation process. By highlighting the results that have been achieved, this chapter will also provide important insights into the program's sustainability and its impact on communities in the future.

**Table 44. KPI Achievement**

No.	Indicator Name	Unit	Baseline	Inter mediate		Endline	
				Target	Achievements	Target	Achievements
A	Project Development Objective Indicator						
1	Targeted people having safer housing completed and occupied	Percent	0	30		90	50,75 (Not Achieved)
2	Served people having strengthened public facilities	Percent	0	30		100	19 (Not Achieved)
3	Targeted people satisfied with completed housing (disaggregated by gender)	Percent	0	30		70	90,8 (Exceeds Target) L:91,6 P:90,1%
B	Intermediate Results Indicator by Components						
B.1	Component 1. Resilient construction of permanent housing units and settlement infrastructure						
1	Housing units constructed to project’s resilience standards	Unit	0	0		3.600	2167 Not yet achieved)
2	Reconstructed houses provided with housing connection for water supply	Percent	0	0		90	91,67 (Exceeds Target)
3	Reconstructed houses provided with sanitation system	Percent	0	0		90	24,88 (Not Achieved)
4	Constructed houses built in resettlement sites provided with direct access to a paved road network	Percent	0	0		90	74,61 (Not Achieved)
5	Women that are aware of land or property title rights in targeted project areas	Percent	0	0		90	87,89 (Not Achieved)
6	Women that are aware of employment opportunities related to recovery activities in targeted project areas	Percent	0	0		90	100 (Exceeds Target)

No.	Indicator Name	Unit	Baseline	Inter mediate		Endline	
				Target	Achievements	Target	Achievements
7	Women's participation in decision-making process meetings	Location	0	0		27	27 (Achieved on Target)
8	Non-CSRRP housing provided with water supply system	Percent	25	30		45	90,66 (Exceeds Target)
9	Non-CSRRP housing provided with strengthened settlement infrastructure	Percent	0	20		30	35,33 (Exceeds Target)
10	Number of kelurahan/village served with local scale infrastructure	Percent	0	20		40	40,12 (Achieved)
<b>B.2</b>	<b>Component 2. Resilient reconstruction and strengthening of public facilities</b>						
1	Education facilities rehabilitated or reconstructed to project's resilience standards	Unit	0	0		18	6 (Not Achieved)
2	Health facilities rehabilitated or reconstructed to project's resilience standards	Unit	0	0		7	2 (Not Achieved)
3	Gender- and disability-inclusive reconstructed public facilities	Unit	0	0		5	2 (Not Achieved)
4	Other public facilities units constructed to project's resilience standards	Percent	0	30		80	33 (Not Achieved)
<b>C</b>	<b>Component 3. Project implementation support</b>						
1	MIS and project website established and Functioning	Yes/No	No.	Yes		Yes	No. (Not yet achieved)
2	Grievance redress mechanism established and functioning	Yes/No	No.	Yes		Yes	Yes (Achieved)
3	Complaints resolved	Percent	0	30		90	96 (Exceeded Target)
4	Resilient and inclusive building standards are established for the project	Yes/No	No.	Yes		Yes	Yes (Achieved)

#### 4.4.1. Project Development Objective Indicator

In achieving the project's development objectives, one of the prominent indicators of success is PDO 3, which measures the level of beneficiary satisfaction with the constructed shelters. This indicator successfully exceeded the set target, with 90.8% of respondents expressing

satisfaction, well above the initial target of 70%. Further analysis shows that male satisfaction reached 91.6%, while female satisfaction reached 90.1%. This success was driven by overall satisfaction with the physical aspects built by the CSRPP program, which not only met but exceeded expectations compared to temporary shelters. This result confirms the effectiveness of the approach taken in the design and construction of the project, where the quality of construction and consideration of the specific needs of beneficiaries were the main factors contributing to the high level of satisfaction. This success is an important indication that an in-depth understanding of end-user needs and expectations can have a significant impact on the outcome of shelter development projects.

For PDO 1 and PDO 2, the evaluation of KPI achievements shows that these two indicators have not yet reached the set targets, indicating several areas that require attention and improvement.

**PDO 1: Safer and Better Equipped Housing** The target for PDO 1 was for 12,441 people to have safer, better equipped housing, with a target achievement of 90%. However, only 50.75% of this target was achieved. Of the 3,880 units planned, only 1,871 units met these criteria. The main factors that led to this non-achievement were several unmet aspects, such as providing clean water, sanitation facilities, adequate solid waste, adequate road access, and occupancy that did not meet the expected safety and comfort standards. This indicates gaps in project implementation, especially in terms of meeting technical specifications and supporting infrastructure.

**PDO 2: Communities Served by Strengthened Public Facilities** For PDO 2, the target was set for 100% of the 236,101 people to have access to strengthened public facilities, such as health and education centers. However, only 19% of this target was achieved, or 44,449 people who have benefited from these facilities. The main causes of this low achievement include the incompleteness of key facilities such as health centers and schools and the lack of adequate supporting infrastructure in some locations. These incompletenesses reflect challenges in project management and inter-sectoral coordination, which are essential for providing effective and inclusive public services.

Both indicators illustrate the importance of close supervision and efficient project management, as well as the need to strengthen coordination between the various stakeholders in the project. To improve the achievement of KPIs in the future, corrective actions are needed aimed at accelerating the completion of infrastructure and facilities, as well as ensuring that all construction elements meet established standards. In addition, improved communication and participation of local communities in the development process can help ensure that project outcomes meet their needs and expectations.

#### ***4.4.2. Component 1. Resilient construction of permanent housing units and settlement infrastructure***

There are several indicators that have successfully achieved and even exceeded the KPI targets that have been set. The following is an analysis of these achievements:

1. Reconstructed Houses Equipped with Clean Water Connection (3600 units): This indicator achieved a result of 91.67% against a target of 90%, demonstrating success in providing houses that were rebuilt and equipped with permanent clean water connections. A total of 91.67% against the target of 90%, units were successfully provided with clean water connections, demonstrating the effective implementation of basic infrastructure that is critical to the health and comfort of residents. This success was achieved mainly due to the fulfillment of installed standards for water installations, which provided accessibility of clean water to residents.
2. All houses outside CSRPP are served with strengthened housing infrastructure (3,824 units): This indicator achieved 100% of the target, where all 3,824 housing units outside CSRPP have been served with strengthened housing infrastructure. This success is attributed to the development of infrastructure covering roads, drainage, solid waste, etc., effectively improving residents' quality of life and comfort. Recognition from the local government, which will formally accept all accountability reports in October 2024, also demonstrates the strong commitment of all parties involved.
3. Villages with Strengthened Neighborhood Scale Infrastructure Services (units): This outcome achieved the target of 100% with all 27 urban villages implementing the Environmental Sanitation Initiative (ISL) completed with strengthened infrastructure services. This indicates timely completion of the project and according to set standards, enabling local communities to benefit from better and more sustainable infrastructure.
4. Women who are aware of land rights or property rights in the targeted project area (%) 45 while the achievement is 90.66, obtained through a survey by OSP to women beneficiaries who participated in the Socialization of Land Legality, Land Legality Discussion. The explanation of the Land Status of the OSP Survey results shows that the impact of the socialization, women understand on whose behalf the property rights are given and also some intend to make a joint deed between husband and wife.
5. Women who are aware of job opportunities related to recovery activities in the project area are targeted at 35%, the achievement is 35.33%, Obtained through OSP data related to women's participation (non-WTB) in socialization to Women related to Job Opportunities at the Project Location The participation of non-WTB women involved in the socialization is about 35% of the total participants who attended.
6. Women's participation in the decision-making process meeting is targeted at 40%, while the achievement is 40.12%, obtained from OSP data on women involved in the discussions: Formation of Pokmas (Women involved in the election of Pokmas Administrators), Selection of Blocks and Parcels/Plots, Environment (Embryo Volunteers forming OPs), Housing Development, Livelihood Data on women's participation in these discussions in existing locations that have not met KPIs, has not also added socialization at ISL locations.



For the analysis of indicators that have not reached the predetermined KPI targets are as follows:

1. Indicator Number of Shelters Built to Project Resilience Standards (Units). The project set a target to build 3,600 dwelling units that had to meet strict project resilience standards, involving the use of Healthy Simple Instant Homes (RISHA), locations that were outside of Disaster Prone Zones (ZRB), as well as the presence of Building Permits (PBG) and Statement of Laik Fungsi (SPLF). Despite the ambitious target, only 2,167 units managed to fulfill all these requirements.

Key Causes of Nonachievement:

- Major obstacles hindering this achievement include difficulties in obtaining PBGs and SPLFs in some locations and challenges in applying RISHA construction standards in areas outside disaster-prone zones but still have limited access to adequate resources and infrastructure. These failures impede the delivery of shelters that are healthy and instantaneous and safe from disasters, which is crucial for the long-term well-being of the occupants. Furthermore, this issue clarifies the importance of improvements in project management and coordination between various agencies to ensure that all shelters are built according to established standards to maximize the safety and comfort of residents.
2. Indicator of Homes Outside CSRPP Shelters with Clean Water (8000 units) (%). This indicator targets 90% of the 8,000 housing units outside CSRPP that should be supplied with clean water, but only achieved 24.88%, with a total of 1,990 units served. This achievement was far below the set target and resulted from a series of activities such as Duyu Water Supply System (SPAM), Pombewe SPAM, Bora Hygiene Quality Intervention (IKK Bora), and Poboya SPAM Optimization.

Key Causes of Nonachievement:

- The Poboya Water Treatment Plant (WTP) in Palu has not yet been completed. This plant plays a crucial role in providing clean water to Nanumbuku, Vatu and Kinta communities, as well as Tadulako University and housing around Tondo and Polda. Delays in the completion of this WTP hampered the distribution of clean water to these areas, which relied heavily on the completion of this facility to meet their clean water needs.
- Unavailability of Risk Sources (SR) in Watunonju and Oloboju Villages. As part of the IKK Bora Sigi service, the presence of SR is essential to ensure the availability of clean water. The absence of this infrastructure in Watunonju and Oloboju villages led to the inability to provide adequate access to water for the villagers.
- No SR for Loru and Pombewe Villages. Similar infrastructure deficiencies also occur in Loru and Pombewe villages as part of the Pombewe sigi SPAM. Failure

to provide these risk sources directly impacts the quality of life of local communities, who face difficulties in gaining access to clean water.

- Incomplete Pipelines and Water Flow Networks in Palu and Sigi City. The unfinished pipeline infrastructure in these cities is hampering the efficiency and coverage of clean water distribution. This hampered process not only slows down the provision of clean water but also increases public health risks due to lack of access to safe water.
3. Indicator for Houses Built with Sanitation Systems (%). This indicator targets that 90% of houses built should be equipped with a comprehensive sanitation system, including installed and functioning installations for gray and black water, and a completed solid waste system. However, the result achieved was only 74.61%, with a total of 2,686 housing units meeting this criterion.

Causes of Nonachievement:

- Incomplete Sanitation Installations in Certain Locations. Some areas particularly Tondo 2, Lende Ntovea 3, and Bangga 2, experienced delays and difficulties in the full completion of sanitation systems. This may be due to logistical challenges, technical limitations, or barriers in the provision of materials and labor required for installation.
  - Difficulties in Project Coordination. Inefficient coordination processes between the various parties involved in construction and supervision may have contributed to delays and shortcomings in meeting the standards set for sanitation systems.
4. Indicator for Houses Built in Relocation Sites with Direct Access to Hardened Road Network (%). This indicator targets that houses built on relocation sites should be provided with direct access to the paved road network, with a minimum target of using 3 meters of sandstone. The overall target was to meet this criterion in 3,164 housing units, but only achieved 87.89% of the target.

Causes of Nonachievement:

- Delays in Road Construction in Specific Locations. There are some specific areas where road construction has not been completed, which include Tondo 2, Lende Ntovea 3, Bangga 1 & 3, and Bangga 2. These delays could be due to various factors, including logistical issues, limitations in allocating resources, or unforeseen technical challenges.
- Technical and Logistical Barriers. There may be technical barriers such as unfavorable soil conditions or logistical issues in the transportation of necessary materials, all of which can hinder the progress of road construction.

#### **4.4.3. Component 2. Resilient reconstruction and strengthening of public facilities**

1. Indicator on Education Facilities Rehabilitated or Reconstructed to Project Resilience Standards. This indicator targets the rehabilitation or reconstruction of 18 educational

facilities to conform to project resilience standards. However, only 6 facilities were rehabilitated or reconstructed, based on data obtained from PHO (Provisional Hand Over), PBG (Building Permit), and SLF (Statement of Functioning). This success was achieved through the Fasdiksar rehabilitation and reconstruction package.

Causes of Nonachievement:

- Work is not yet complete at key locations. Some targeted educational facilities, including facilities at Universitas Tadulako (Untad), Fasdiksar 2A, and Fasdiksar 2B, have not yet been completed. This has hindered the achievement of the overall targets set for the project.
  - Technical and Logistical Constraints. The rehabilitation and reconstruction process may face technical or logistical constraints that slow down completion in these locations. These include limited resources, delays in material delivery, or lack of coordination between contractors involved in the project.
2. Indicator of Health Facilities Rehabilitated and Reconstructed to Project Resilience Standards. This indicator targets the rehabilitation or reconstruction of 7 health facilities to conform to project resilience standards. However, the achievements obtained are only 2 health facilities that have been rehabilitated or reconstructed, namely Torabelo Hospital and Tipo Health Center. This data is obtained from PHO (*Provisional Hand Over*), PBG (Building Permit), and SLF (Statement of Functioning), which shows that both facilities have met the established project resilience standards.

Causes of Nonachievement:

- Rehabilitation of Other Health Facilities Not Completed. Several critical health facilities, including Undata Hospital, Anutapura Hospital, and 3 posyandu in Palu, have yet to be rehabilitated or reconstructed. Delays in the completion of these facilities have been a major factor hindering the achievement of the overall target.
  - Technical and Logistical Constraints. Rehabilitation projects in some unfinished health facilities may face technical constraints such as construction, material procurement, or project management difficulties. In addition, factors such as poor coordination between parties involved in the project may slow down the completion process.
3. Indicator of Public Facilities Rehabilitated and Reconstructed According to Project Resilience Standards. This indicator targets the rehabilitation and reconstruction of 5 public facilities by project resilience standards. However, the achievements obtained only include 2 facilities that have been completed, namely the High Prosecutor's Office (Kejati) Building and Pombewe Meeting Hall. This data is obtained from PHO (Provisional Hand Over), PBG (Building Permit), and SLF (Statement of Good Function), which shows that these two facilities have met the standards set in the project.

Causes of Nonachievement:

- **Some Public Facilities Have Not Been Completed:** There are several important public facilities that have not yet been rehabilitated or reconstructed, namely the Tondo 2 Meeting Hall, PIP2B Working Unit Building, PIP2B KTU Building, Sigi Regent's Office, and the Office of the Provincial National Narcotics Agency (BNNP). This non-completion hampered the achievement of targets set for public facility rehabilitation projects.
- **Constraints in the Construction Process:** These delays are most likely caused by various technical and logistical constraints, such as difficulties in procuring materials, problems in the construction process, or lack of coordination between the parties involved. These factors affect the pace of project completion in different locations, thereby affecting the project's ability to meet its time targets and resilience standards.

#### **4.4.4. Component 3. Project implementation support**

Of the four indicators set, three have been achieved, while one indicator remains unmet. The following is an explanation of the achievements of the indicators that have successfully reached the target.

1. **Established and Functioning Grievance Redress Mechanism Indicator.** This indicator targets the establishment of a grievance redress mechanism and the functioning of the project according to project standards. This outcome has been successfully achieved, with the grievance mechanism established and functioning optimally. Parameters that ensure this mechanism is functioning well include the availability of a Complaints Standard Operating Procedure (SOP), available Public Information and Community Complaints Service (LIPPM) media, and routine reporting of complaints data.

This success was achieved because all supporting elements of the grievance mechanism have been fulfilled. The Complaints SOP allows for a clear procedure in handling each incoming complaint. In addition, the available LIPPM Media provides access to the public to submit their complaints easily, while the regular reporting system of complaints data ensures transparency and accountability in the complaints resolution process.

2. **Indicator of Grievances Managed and Resolved (%).** This indicator targets the resolution of incoming complaints as part of the project's complaint handling mechanism. This achievement shows very positive results, where out of a total of 3,333 incoming complaints, 3,185 complaints, or 96%, have been successfully managed and resolved.

The success in managing and resolving complaints is supported by accurate data and a well-functioning complaints mechanism. Incoming complaints are systematically recorded and processed through a clear handling flow, in accordance with the established Standard Operating Procedures (SOP). A transparent reporting system ensures that each complaint receives an adequate response and solution. The 96%

resolution rate is an indicator of the success of this mechanism in responding to the needs of the community regarding the various issues they convey.

3. Resilient and Inclusive Building Standards Indicator Built for the Project. This indicator targets that buildings constructed under the project must meet resilience and inclusiveness standards. This achievement has been successfully met, with the development of modules related to resilient and inclusive building standards which were then socialized and distributed to relevant parties.

The achievement of this indicator was supported by the development of a module containing guidelines related to disaster-resilient and inclusive building standards for all community groups, including persons with disabilities and women. The module has been widely socialized to all parties involved in the project, such as contractors, project supervisors, and other stakeholders. The module serves as an official reference in the development process, ensuring that every building constructed is not only strong in terms of construction but also takes into account aspects of accessibility and gender equality.

The following is an analysis of indicators that have not yet reached the target in accordance with the KPIs that have been set:

1. Indicator on Established and Functioning SIM and Project Website. This indicator targets the project's Management Information System (MIS) and website, which should be established and functioning as part of the project's digital infrastructure. Initially, the SIM and project website were functional until June 2024. However, after an attack on the PDN (Public Data Network), the system has not been fully recovered and cannot function optimally until now.

Causes of Nonachievement:

- The attack on the National Data Center (NDC) was the main cause of the malfunction of the SIM and the project website. This attack caused significant disruption to system accessibility and necessitated the migration of the server to a new IP address.
- System recovery is still in progress, with the target completion of Phase 2 expected by the end of October. This shows that the system has not fully returned to normal, although repair efforts have started to show results with partial data recovery.

#### **4.4.5. Infrastructure Quality and Effectiveness**

##### **A. Effectiveness and Quality of Huntap Construction & Basic Facilities**

This section presents a comprehensive analysis of the effectiveness and quality of permanent housing (Huntap) and basic facilities. The evaluation covers various aspects of quality and functionality across three types of residential units: Area, Self-Contained, and Satellite.

**Table 45. Huntap Quality**

No	Types of Huntap	Number of Samples (Units)	Quality of Building Layout	Quality of Safety Aspects	Quality of Health Aspects	Quality Aspect of Comfort	Quality Aspect of Convenience	Total Quality
1	Area-Scale Permanent Housing	95	96.08	94.56	92.88	97.89	80.58	<b>92.67</b>
2	Self-Land Provision Permanent Housing	42	91.53	96.71	90.17	98.81	89.78	<b>93.81</b>
3	Satellite-Scale Permanent Housing	89	97.77	98.60	98.79	100.00	98.90	<b>98.78</b>
		<b>226</b>	<b>95.13</b>	<b>96.62</b>	<b>93.94</b>	<b>98.90</b>	<b>89.75</b>	<b>95.09</b>

The table above shows that the Satellite Huntap shows that the comfort aspect achieved a perfect score of 100%, higher in all aspects of quality including safety, health, and comfort. In particular.

In Mandiri huntap for the highest percentage in terms of safety and comfort, by reaching 98.81 in comfort, slightly superior to other types, and showing a prominent score of 96.71 in safety.

For the Regional shelter, although slightly lower in overall quality, it still maintained a strong performance with scores above 90 in all categories, demonstrating a consistent standard across all housing types.

**Table 46. Huntap Functionality**

No	Types of Huntap	Number of Samples (Units)	Building Functionality	Functionality of Building Utilities	Residential	Maintenance	Total Functionality
1	Area-Scale Permanent Housing	95	99.58	82.02	100.00	86.11	<b>89.94</b>
2	Self-Land Provision Permanent Housing	42	100.00	81.61	100.00	64.76	<b>85.60</b>
3	Satellite-Scale Permanent Housing	89	98.54	93.24	100.00	74.83	<b>91.97</b>
		<b>226</b>	<b>99.37</b>	<b>85.62</b>	<b>100.00</b>	<b>75.23</b>	<b>89.17</b>

In the functionality assessment, Huntap Satellite with a building functionality score of 98.54 and maintenance of 74.83, reflects a good balance between usability and maintenance, although there is still room for improvement in maintenance.

Huntap Mandiri, despite achieving perfect occupancy and building functionality with a score of 100.00, experienced challenges in maintenance with the lowest score in the table of 64.76, indicating the need for improvement in the maintenance aspect.

For the shelter, the area showed high building function with a score of 99.58 and maintainability of 86.11, showing good utilization and effective maintenance.

**Table 47. Results of Observation and Assessment of Effectiveness**

No	Types of Huntap	Number of Samples (Units)	KPI 1.1	KPI 1.2	KPI 1.3	KPI 1.4	Electrical Installation Systems	The house is occupied	PDO 1
			<i>Housing units constructed to project's resilience standards</i>	<i>Reconstructed houses provided with housing connection for water supply</i>	<i>Reconstructed houses provided with sanitation system</i>	<i>Constructed houses built in resettlement sites provided with direct access to a paved road network</i>	<i>Electrical Installation Systems</i>	<i>The house is occupied</i>	<i>Targeted people having safer housing completed and occupied</i>
1	Area-Scale Permanent Housing	95	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	<b>100.00%</b>
2	Self-Land Provision Permanent Housing	42	100.00%	95.24%	92.86%	100.00%	100.00%	100.00%	<b>88,10%</b>
3	Satellite-Scale Permanent Housing	89	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	<b>100.00%</b>
		<b>226</b>	<b>100.00%</b>	<b>99.12%</b>	<b>98.67%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>97.79%</b>

The permanent housing development program (Huntap) has achieved the final target with very high effectiveness and construction quality in all types of Huntap, namely Regional, Independent, and Satellite. Based on observation and assessment of effectiveness, this program successfully met all the KPIs set with 226 sample housing units built in accordance with project durability standards. Every home in all types of Huntap has been equipped with an electrical installation system, full occupancy, and direct access to a network of paved roads, demonstrating the program's commitment to ensuring sustainability and comfort for its residents.

Especially for Huntap Mandiri, there was a slight decrease in the provision of housing connections for water supply and sanitation systems, with achievements of 95.24% and 92.86%, respectively. Nonetheless, it still shows a very high success rate. The program also succeeded in ensuring that 97.79% of the target population has inhabited safer housing and has been fully completed, with near-perfect achievement in all other indicators.

This success reflects the effectiveness of the strategies and policies implemented, ensuring that each residential unit is not only built to meet physical needs, but also supports the overall improvement of the quality of life for its occupants.

## **B. Comparison of KPI Achievements and Infrastructure Observation Results**



In the evaluation of the KPI achievements of the Huntap development program, observations by ESC showed impressive results with 100% compliance with project durability standards in all residential units. However, there is a difference in the achievement of the overall KPI which is assessed from 3880 units with an average achievement of 55% for all KPIs measured. This indicates that, although all units meet resilience standards, there is variation in the level of achievement of other infrastructure such as water connections, sanitation systems, and paved road access.

**Table 48. Comparison of KPI Achievements and Infrastructure Observation Results**

No	Description	KPI 1.1	KPI 1.2	KPI 1.3	KPI 1.4	Electrical Installation Systems	The house is occupied	PDO 1
		<i>Housing units constructed to project's resilience standards</i>	<i>Reconstructed houses provided with housing connection for water supply</i>	<i>Reconstructed houses provided with sanitation system</i>	<i>Constructed houses built in resettlement sites provided with direct access to a paved road network</i>	<i>Electrical Installation Systems</i>	<i>The house is occupied</i>	<i>Targeted people having safer housing completed and occupied</i>
1	ESC Observation Results	100,00%	99,12%	98,67%	100,00%	100,00%	100,00%	<b>97,79%</b>
2	KPI Achievement	2.167/55%	91,67	74,61	87,89	Not counted	90,9%	<b>50,75*</b>

KPI related to the provision of housing connections for water supply recorded an achievement of 91.67%, while for the sanitation system it was achieved at 74.61%, which indicates an area that needs more attention in completing infrastructure.

Access to the paved road network has been successfully implemented, reaching 87.89%, confirming the high quality of supporting infrastructure in this project.

Although the home occupancy rate reaches 100%, the proportion of people who have safer and fully completed and occupied housing is only 50.75%, which may indicate the existence of other factors that affect the willingness of residents to move to this new residence.

These results reflect the challenges faced in achieving full consistency across all aspects of the infrastructure built, as well as the importance of paying attention to the factors affecting the final settlement of residents. The program, with significant achievements on many indicators, still has the potential for improvement in some specific areas to achieve more optimal effectiveness and quality.

### C. Results of Observation of Public Facility Quality

The public facility construction program has achieved very satisfactory results with an

average overall quality of 97.95%, indicating that almost all facilities built have met or even exceeded the set standards.

**Table 49. Results of Observation of Public Facility Quality**

No	Types of Public Facilities	Quality of Building Layout	Quality of Safety Aspects	Quality of Health Aspects	Quality Aspect of Comfort	Quality Aspect of Convenience	Total Quality
1	Half-exchange Type	99.29	98.67	94.40	100.00	100.00	<b>98.50</b>
2	Anatapura Hospital - Cassowary Treatment Room	95.17	97.65	98.00	100.00	94.74	<b>97.18</b>
3	Anatapura Hospital - Administration Room	95.92	90.15	97.92	100.00	95.09	<b>95.11</b>
4	Anatapura Hospital - CT Scan Room	100.00	98.91	100.00	100.00	100.00	<b>99.67</b>
5	SD Inpres Donggala Kodi	98.62	98.26	97.14	100.00	100.00	<b>98.74</b>
6	SD IT Insan Gemilang	96.61	100.00	97.78	100.00	100.00	<b>99.02</b>
7	Adventist Junior High School Building	97.87	97.44	97.33	100.00	100.00	<b>98.39</b>
8	SMPN 19 Building	98.18	92.98	100.00	100.00	100.00	<b>97.58</b>
9	Kejati Building Prov. Central Sulawesi	89.69	100.00	96.67	100.00	98.53	<b>97.36</b>
		<b>96.82</b>	<b>97.12</b>	<b>97.69</b>	<b>100.00</b>	<b>98.71</b>	<b>97.95</b>

Here are the details of the quality evaluation for the nine public facilities covered in the survey:

- **The Tipo Health Center and Cassowary Care Room at Anantapura Hospital** show high quality in all aspects, especially comfort and convenience with a perfect score of 100%, but there is room for improvement in safety and health aspects.
- **The Administration Room and CT Scan Room of Anantapura Hospital** showed an extraordinary standard with the CT Scan Room achieving a total score of 99.67%, indicating the highest achievement in all aspects assessed.
- **SD Inpres Donggala Kodi and SD IT Insan Gemilang** recorded scores above 96% for all categories, with outstanding ratings in comfort and convenience.
- **The Advent Junior High School and SMPN 19 buildings** also show excellent quality, especially in comfort and convenience with a perfect score of 100%.
- **Kejati Prov. SulTeng** has the lowest score in this group with 97.36% but still shows excellent results, especially in terms of comfort and convenience.

In general, monitoring the quality of public facilities shows that this development program has successfully implemented facilities with high standards, strengthening public infrastructure that is urgently needed for community services. This achievement

reflects the effectiveness of the strategy and resource allocation in the program.

#### D. Results of Observation of the Functioning of Public Facilities

The results of the observation of the functioning of public facilities showed that the majority of facilities had functioned well, achieving high overall scores in various aspects of the assessed functioning

**Table 50. Results of Observation of the Functioning of Public Facilities**

No	Types of Public Facilities	Building Functionality	Functionality of Building Utilities	Building Safety Functionality	Building Accessibility	Building Maintenance	Total Functionality
1	Half-exchange Type	100.00	96.36	100.00	100.00	86.67	<b>96.61</b>
2	Anatapura Hospital - Cassowary Treatment Room	100.00	100.00	100.00	100.00	86.67	<b>97.33</b>
3	Anatapura Hospital - Administration Room	100.00	100.00	50.00	100.00	86.67	<b>87.33</b>
4	Anatapura Hospital - CT Scan Room	50.00	100.00	100.00	100.00	86.67	<b>87.33</b>
5	SD Inpres Donggala Kodi	86.67	100.00		100.00	73.33	<b>92.00</b>
6	SD IT Insan Gemilang	100.00	88.42		100.00	86.67	<b>93.86</b>
7	Adventist Junior High School Building	80.00	94.67		100.00	100.00	<b>94.40</b>
8	SMPN 19 Building	100.00	100.00		100.00	87.50	<b>97.50</b>
9	Kejati Building Prov. Central Sulawesi	100.00	100.00	100.00	100.00	87.50	<b>97.50</b>
		<b>90.74</b>	<b>97.72</b>	<b>90.00</b>	<b>100.00</b>	<b>86.85</b>	<b>93.76</b>

Here are the functional details for the nine public facilities observed:

- **The Tipo Health Center and facilities at Anantapura Hospital** showed perfect building functionality with a score of 100%. In particular, the Cassowary Care Room and the Hospital Administration Room achieved a very high total functional score, reflecting efficiency and reliability in daily operations.
- **The CT Scan room of Anantapura Hospital** showed variability in functionality with a building functionality score of only 50%, but still excelled in utility, safety, and accessibility of the building.
- **SD Inpres Donggala Kodi** has a high building functionality at 86.67% and a total functionality score of 92%, indicating consistency in maintenance and accessibility.
- **SD IT Insan Gemilang** and **SMPN 19 Building** also achieved high scores in building and utility functionality, with both facilities recording a total functional score above 93%.

- **Kejati Prov. Sulteng** stands out with a total functionality score of 93.76%, showing success in terms of adequate maintenance and accessibility of buildings.

From the observed data, it can be seen that efforts to maintain and manage public facilities have resulted in a high level of functionality. This shows that the public facility development program focuses not only on physical development but also on sustainable maintenance and improved accessibility, all of which are key factors in achieving the program's targets.

#### E. Effectiveness of Public Facilitation

The evaluation of the effectiveness of public facilities conducted by ESC showed outstanding results, with all facilities tested meeting 100% of the set KPIs.

**Table 51. Effectiveness of Public Facilitation**

No	Types of Public Facilities	KPI 2.1 = Educational facilities that are rehabilitated or reconstructed according to project resilience standards	KPI 2.2 = Health facilities that are rehabilitated and reconstructed according to project resilience standards	KPI 2.3 = Public Facilities that are rehabilitated and reconstructed according to project resilience standards	KPI 2.4 = Reconstructed public facilities meet inclusivity standards – gender and disability	PDO 2 = served people having strengthened public facilities
1	Half-exchange Type		100	100	100	<b>100</b>
2	Anatapura Hospital - Cassowary Treatment Room		100	100	100	<b>100</b>
3	Anatapura Hospital - Administration Room		100	100	100	<b>100</b>
4	Anatapura Hospital - CT Scan Room		100	100	100	<b>100</b>
5	SD Inpres Donggala Kodi	100		100	100	<b>100</b>
6	SD IT Insan Gemilang	100		100	100	<b>100</b>
7	Adventist Junior High School Building	100		100	100	<b>100</b>
8	SMPN 19 Building	100		100	100	<b>100</b>
9	Kejati Building Prov. Central Sulawesi			100	100	<b>100</b>
		<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

The following are details of the success of each facility in meeting various KPI indicators:

- **The Tipo Health Center, Cassowary Care Room, and Administration Room of Anantapura Hospital**, as well as **the CT Scan Room** have been fully rehabilitated or reconstructed in accordance with the project's resilience standards, which include inclusive educational, health, and public facilities, as well as paying attention to gender and disability aspects.

- **SD Inpres Donggala Kodi, SD IT Insan Gemilang, Advent Junior High School Building, SMPN 19 Building, and Central Sulawesi Provincial Attorney Building** also showed optimal results in these four categories, indicating that the construction or rehabilitation of these facilities has succeeded in achieving the expected inclusivity and sustainability goals.

These results illustrate significant achievements in efforts to improve the quality and accessibility of public facilities, affirming the program's commitment to implementing projects that not only meet high standards but also encourage inclusive community empowerment. This success is a strong indicator that the program has been effective in achieving the targets that are used as a benchmark for the success of public infrastructure construction and rehabilitation.

#### F. Comparison of KPI Achievements and Infrastructure Observation Results

This section describes the comparison between the results of the observations made by the Environmental Services Company (ESC) and the results of the overall KPI calculation for the program. The ESC shows 100% achievement for all KPIs measured, which indicates that the assessed facilities have fully met the project standards in terms of education, health, public functioning and inclusivity.

**Table 52. Comparison of KPI Achievements and Infrastructure Observation Results**

No	Description	KPI 2.1 = Educational facilities that are rehabilitated or reconstructed according to project resilience standards	KPI 2.2 = Health facilities that are rehabilitated and reconstructed according to project resilience standards	KPI 2.3 = Public Facilities that are rehabilitated and reconstructed according to project resilience standards	KPI 2.4 = Reconstructed public facilities meet inclusivity standards – gender and disability	PDO 2 = served people having strengthened public facilities
1	ESC Observation Results	100.00%	100.00%	100.00%	100.00%	<b>100.00%</b>
2	KPI calculation results	6 (33)%	2 (28)%	2 (40)%	33 (41)%	<b>19%</b>

The following are the details of the Comparison of KPI Achievements and Infrastructure Observation Results carried out by ESC:

- For **Educational Facilities**, 33% of the target was achieved.
- For **Health Facilities**, 28% of the target was achieved.
- For **Public Public Facilities**, 40% of the target was achieved.
- For **Inclusive Public Facilities**, 41% of the target was achieved.

Significant discrepancies between ESC results and KPI calculations can be attributed to differences in measurement methods and parameters, with ESCs conducting limited evaluations to facilities that have been completed, while KPI calculations covering the entire broader set of activities. This indicates that, while some facilities have achieved high standards as observed by the ESC, there are still many aspects of the program as a

whole that require attention and improvement to achieve the expected effectiveness on a broader scale.

### **Factors affecting the achievement of Construction Effectiveness and Quality targets**

Factors affecting the achievement of construction effectiveness and quality targets can be divided into three main stages: planning, execution and maintenance. Each stage has challenges and key elements that require special attention in order for the construction project to succeed according to the set targets.

#### **1. Planning Stage**

Good coordination between stakeholders such as the project owner, local government, consultants, contractors, sub-contractors, and communities is crucial at the planning stage. The planning process should cover every aspect, from initial planning, land provision, design, to changes that may occur throughout project implementation. Failure to synchronize all these stakeholders can lead to imperfections in plan implementation. For example, in the Huntap infrastructure project, although supporting infrastructure such as water supply systems and waste management have not been completed, residents have already occupied the area. This indicates a gap between planning and implementation, which can have a negative impact on the quality of life of the residents as well as the overall effectiveness of the project.

#### **2. Implementation Stage**

Furthermore, the implementation stage plays a vital role in ensuring that what is planned can be realized in a timely manner and according to quality standards. Some of the main factors that affect implementation include the availability of sufficient skilled laborers. The workforce must have skills that match the demands of the project and be able to complete the work on time. In addition, a safe working environment is also a critical factor. For example, community resistance in Tompe led to a temporary suspension of work due to land ownership claims. Situations like this can disrupt the smooth running of the project and cause delays that impact the overall schedule. In addition, construction management on unstable land is also a challenge, as was the case in Tondo Huntap, where there was a decline in construction quality due to ground shifting. In addition, the quality of materials and materials used must always be assured through adequate testing so that the final result meets the set standards. Consistent control and monitoring must also be carried out to ensure that each stage of implementation is in accordance with the plan.

#### **3. Maintenance Stage**

Finally, the maintenance phase is equally important in maintaining the sustainability and effectiveness of the completed construction project. For public infrastructure projects, the maintenance process is often hampered by problems with the asset handover mechanism. This can hamper efforts to maintain the condition of the infrastructure in the long term. As for residential infrastructure, the main challenge

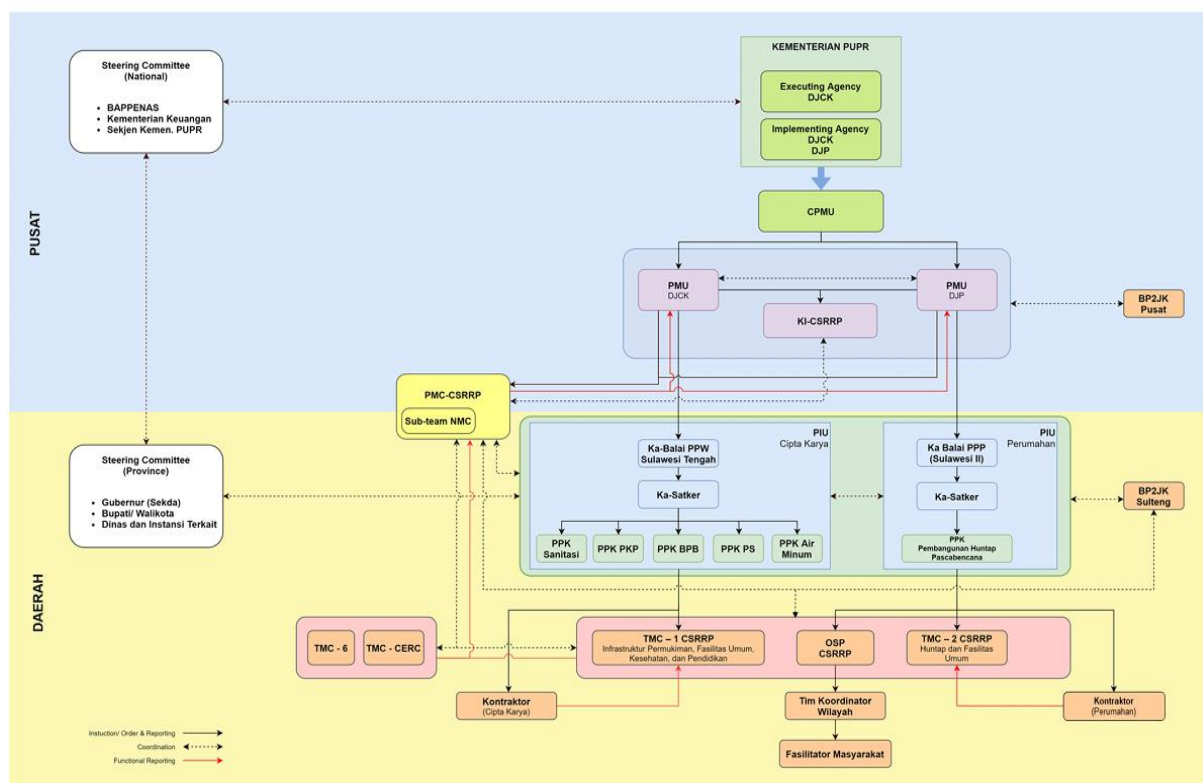
lies in the legality of Operation and Maintenance (O&P), as well as the lack of budget allocation for routine maintenance. If these aspects are not properly anticipated, then the quality of the infrastructure may degrade over time, resulting in greater repair costs in the future.

Overall, the successful achievement of construction effectiveness and quality targets requires comprehensive and integrated management at every stage, from planning, implementation, to maintenance. Every factor, be it technical, logistical, or social, must be taken seriously so that the project is not only completed on time, but also provides sustainable benefits for the community and users of the infrastructure.

#### 4.5. Effectiveness of Institutional Arrangement to Achieve End Targets

In general, Institutional Structuring in achieving CSRRP targets:

1. Not Effective for the achievement of KPI targets, especially PDO 1 and 2, KPIs 1.1, 1.3, 1.4, 1.8, 2.1, 2.2, 2.3, 2.4 and 3.1
2. Effective in terms of WTB Identification, Land Acquisition, Social and Environmental Safeguards, PBG & SLF, Complaint Handling and Asset Management, Institutional Arrangement in general is shown by:
  - a. The existence of institutions such as guidelines/regulations such as Presidential Instruction 10 years 2018, and number 8 of 2022, the existence of POM, ESMF, etc.
  - b. The existence of an organizational structure and the division of tasks and functions between fields both in SEP and in POM as well as good implementation.





**Figure 43. CSRRP Organizational Structure**

First, **there are institutional** institutions such as those responsible for preparing guidelines and regulations related to implementing activities at each stage of the project. This institution ensures that project implementation is carried out by the standard operating procedures and rules that have been set, so that it runs in an orderly and effective manner.

Secondly, a good **organizational structure** and a clear division of tasks and functions between sectors play an important role in supporting project success. This structure ensures that each sector is aware of its duties and responsibilities, which minimizes the potential for overlap or misunderstanding in field implementation. Good coordination between various parties at the central and local levels is essential in ensuring that all project activities can be carried out efficiently and on target.

In this CSRRP project, the organizational structure involves various key institutions. At the central level, a Steering Committee includes BAPPENAS, the Ministry of Finance, and the Ministry of PWOH, which is responsible for strategic oversight. At the provincial level, the Steering Committee consists of governors, regents/mayors, and relevant agencies that oversee implementation on the ground. At the operational level, the PMC-CSRRP is tasked with coordinating various technical teams and contractors, as well as managing technical implementation in the field. In addition, the Regional Coordinator Team and Community Facilitators also play a role in ensuring the implementation of project activities in the field runs smoothly and according to plan.

With good institutional governance, both in terms of institutional guidelines and a well-planned and coordinated organizational structure, **CSRRP has been able to perform its functions** effectively to achieve targets in the rehabilitation and reconstruction of infrastructure in Central Sulawesi after the disaster.

The following table shows the effectiveness of institutional arrangements in achieving the relevant KPI targets.

**Table 53. Effectiveness of Institutional Arrangement for Target Achievement**

No.	Achievements	Indicators	Final target	Results	Explanation	Effectiveness of Institutional Arrangement
<b>Project Development Objective Indicator</b>						
1	Indicators achieved as per KPI targets,	PDO 3: Targeted shelter beneficiaries who are satisfied with their shelter (by gender) (%)	70	90,8 (Exceeds Target) L:91,6 P:90,1%	Results of the ESC BSA Study	Effective

No.	Achievements	Indicators	Final target	Results	Explanation	Effectiveness of Institutional Arrangement
2	Indicators have not been achieved according to KPI targets	PDO 1: Target communities (12,441 people) get safer housing, complete facilities and are occupied (%)	90	50,75*	Only 1871 out of 3880 units (6314 people) have been reached in Tondo 2, Talise Panau 1,2,3, Talise Panau Bamba, Palu Independent Housing, Lende Ntovea Satellite Housing 3, Lompio Satellite Housing, Bangga Satellite Housing 1&3, Bangga Satellite Housing 2, Poi Satellite Housing, Rogo Satellite Housing.	Not yet effective
		PDO 2: Communities served (236,101 people) by strengthened public facilities (%)	100	19	Derived from beneficiaries (99,102) of Puskesmas Tipu, Torabelo Hospital, Kejati Building, 6 Diksar, and Pombewe Meeting hall (44,449 people), which have not been reached at Untad, Fasdiksar 2A and fasdiksar 2B.	Not yet effective
I	Component 1					
1	6 indicators achieved as per KPI target	Reconstructed houses equipped with clean water connection (3600 units) (%)	90	91,67*	indicator of completed houses with permanent clean water service (3,300 units)	Effective
		Houses outside CSRRP that received strengthened settlement infrastructure services (3,824 units) (%)	90	100	All 3824 houses outside the CSRRP targeted have been served by	Effective
		Villages with strengthened neighbourhood-scale infrastructure services (units)	27	27	All wards that conducted ISL have completed	Effective
		Women aware of land or property rights in targeted project areas (%)	45	90,66	Obtained through a survey by OSP to women beneficiaries who participated in the Socialisation of Empowerment, Land Legality Rembug activities. Explanation of Land Status	Effective
		Women realising employment opportunities related to recovery activities in targeted project areas (%)	35	35,33	Obtained through OSP data related to women's participation (non-WTB) in socialisation to Women related to Employment Opportunities at the Project Site.	Effective
		Women's participation in decision-making process meetings (%)	40	40,12	Obtained from OSP data on women involved in Rembug-rembug: Pokmas Formation (Women are involved in the selection of Pokmas Management), Block and Persil/Lot Selection, Neighbourhood (Volunteer Embryo for the formation of OP), House Development, Livelihoods	Effective

No.	Achievements	Indicators	Final target	Results	Explanation	Effectiveness of Institutional Arrangement
2	4 indicators have not reached the KPI target	Number of shelters built to project resilience standards (units)	3600	2.167*	indicators of houses according to project standards, namely: RISHA construction, outside ZRB, has PBG and SPLF.	Not yet effective
		Houses outside CSRRP shelters with clean water (8000 units) (%)	90	24,88*	Obtained from SPAM Duyu, SPAM Pombewe, IKK Bora and SPAM Poboya Optimisation activities (1,990 units).	Not yet effective
		Houses built equipped with sanitation system (%)	90	74,61*	indicator of completed houses with sanitation system i.e. SR grey water and black water installed and functioning as well as completed waste disposal in 2,686 units.	Not yet effective
		Houses built in relocation sites with direct access to hardened road network (%)	90	87,89*	indicator of completed houses with road access (minimum 3 m sirtu) that meet the criteria (3,164 units)	Not yet effective
III Component 2						
1	All Indicators (4 indicators) have not yet reached the KPI target	Education facilities rehabilitated or reconstructed to project resilience standards	18	6	Obtained from PHO, PBG and SLF data, Achievements obtained from Fasdiksar Package	Not yet effective
		Health facilities rehabilitated and reconstructed to project resilience standards	7	2	Obtained from PHO, PBG and SLF data Achievements obtained from Torabelo Hospital, and Tipo Health Centre	Not yet effective
		Public facilities rehabilitated and reconstructed to project resilience standards	5	2	Achievements obtained from PHO, PBG and SLF data of Kejati Building and Pombewe Meeting Hall	Not yet effective
		Reconstructed public facilities meet inclusivity standards - gender and disability	80	33	Achievements obtained from Torabelo Hospital, Tipo Health Centre, and Attorney General's Office Building, with a divisor of all public facility building targets.	Not yet effective
IV Component 3						
1	3 indicators achieved as per KPI target	A grievance redress mechanism has been established and is functioning (Yes/No)	Yes	Yes	Grievance mechanism is established and functioning	Effective
		Complaints resolved (%)	90	96	Complaints have been managed and resolved	Effective
		Resilient and inclusive building standards built for the project	Yes	Yes	Resilient and inclusive building standards met	Effective

No.	Achievements	Indicators	Final target	Results	Explanation	Effectiveness of Institutional Arrangement
2	1 indicator has not met the KPI target	SIM and project website are up and running (Yes/No)	Yes	No.	The SIM and website were functional until June 2024, but after the attack on the PDN, they have not been fully restored to date.	Not yet effective

These achievements show that some areas have succeeded in achieving or exceeding the expected targets, while other areas still need improvements and improvements in institutional structuring to achieve the desired effectiveness. This narrative summarizes the extent to which each KPI indicator is successfully achieved and provides insight into how institutional structuring can affect the expected outcomes in the project or program.

When viewed from the effectiveness of institutional collaboration, effective institutional collaboration is essential to ensure the success and sustainability of the *Central Sulawesi Rehabilitation and Reconstruction Project* (CSRRP) program. There are several key factors that enable such collaboration, especially in the two main stages of activities, namely the identification of Disaster Affected Areas (DAPs) and land provision.

### 1. Identification of Disaster Affected Areas (DAPs)

One important factor in this stage is the existence of clear regulations. Presidential Instruction Number 10 of 2018 and Number 8 of 2021 are crucial in regulating the structured data collection of WTBs. In addition, the Governor's Decree related to the tenure of the WTB, as well as the Regent/Mayor Decree regulating the WTB and the residents who are entitled to occupy the area, provide a strong legal framework for project implementation. The WTB verification process conducted by the local government with facilitation support from OSP (Organization Supporting Partner) ensures that the data collected is accurate and valid, thus facilitating program implementation in the field.

### 2. Land Provision

Land provision for reconstruction projects requires strong coordination between various parties. Presidential Instruction No. 10/2018 and No. 8-2021 provide provisions on coordination and the division of local government roles in land provision, providing an important legal basis. In addition, the common need among stakeholders to address disaster-related land provision issues ensures that all parties are working with aligned goals.

Regular communication and coordination mechanisms between stakeholders, organized by the Central Project Management Unit (CPMU) and Project Management Unit (PMU), are also key to avoid miscommunication and speed up decision-making. In addition, the Ministry of Public Works and Housing (PWOH) actively provides formal and interpersonally assistance to local governments through various assistance consultants such as PMC, TMC, and OSP. This assistance helps local governments in carrying out their responsibilities related to land provision, while ensuring the sustainability of the reconstruction program.

### **3. Social & Environmental Safeguard Management**

In the management of social and environmental safeguards, an important role is played by various regulations and management mechanisms that have been identified through the Environmental and Social Management Framework (ESMF), Stakeholder Engagement Plan (SEP), and Project Operation Manual (POM) adopted under CSRRP. Each project implementer, local government, consultant, and contractor has been assigned a clear role to ensure that each stage of project implementation complies with environmental and social standards. The stakeholder engagement strategy formulated in the SEP is key to the successful management of social and environmental aspects. All stakeholders that have been identified from the beginning, ranging from affected residents to implementing partners at the central and local levels, have been involved from the preparation stage to construction implementation. The importance of complying with the ESMF and SEP has been strictly maintained to ensure that the set standards are implemented consistently.

### **4. Issuance of PBG (Building Permit) and SLF (Certificate of Functioning)**

The stages of PBG and SLF issuance require careful regulatory readiness at the local government level. The readiness of regulations and organizational structures in the regions allows the proposal of PBG and SLF documents to run smoothly. In addition, the readiness of human resources in the local government and the consultant in charge of facilitating this process is a key factor. Balai facilities through TMC (Technical Management Consultant) 1 and TMC 2 also provide technical assistance in the preparation of the required documents, ensuring that the entire administrative process runs according to the provisions.

### **5. Complaint Handling**

One of the determining factors for the sustainability of CSRRP is how complaints or grievances from affected communities can be managed properly. To this end, a clear standard operating procedure (SOP) for grievance handling is in place, and there is an established mechanism for receiving and handling grievances through established channels. The PMC conducts grievance management under the supervision of the PMU to ensure a quick and appropriate response. Understanding the grievance procedure among relevant parties is also important to ensure a smooth process.

Speed of response, coordination, and communication are the main focus in handling complaints in every project line. In the field, complaints, especially in Huntap, can be directly handled through a complaint post that is integrated with contractors, TMC, and OSP, which shows the effectiveness of the complaint management system in the field. In some cases, complaints can be handled quickly through digital communication media, such as WhatsApp groups, which facilitates a quick response from all parties involved.

### **6. Asset Management**

Asset management in CSRRP projects is an important aspect that requires strong collaboration between various parties. The asset handover process between the Ministry of PWOH through BPPW or BP2P with local governments (Pemda), DPOs, institutions,

and communities is one of the key success factors of this project. Good coordination in the handover process ensures that the assets that have been built can be managed optimally at the local level.

The importance of regulations on the clear division of authority and responsibility between various stakeholders is also a concern. A clear division of roles, such as the suitability of the tupoksi (duties, principal, and functions) of OPDs or institutions with the function/designation of assets or the livelihoods of residents, helps ensure that assets are managed in accordance with applicable needs and policies.

The asset handover process is carried out from PWOH to the LG, which is then continued to the BMD user OPD (Regional Property Goods), or handed over to other institutions such as BUMD, foundations, private schools, or communities located in the WTB. This ensures that the right parties manage assets in accordance with their designation.

In addition, the readiness of the LG, OPD, institution, or other party that will receive the asset is also a key factor. This readiness includes the ability to receive, manage, operate, maintain, and develop the assets received. In this case, several important aspects, including readiness in terms of policies and regulations, organizational structure, management SOPs, and the application of tariffs or levies that consider the community's purchasing power and economic capacity. In addition, the readiness of recipient stakeholders in terms of budget availability, human resources (HR), and capacity building for asset management are also important factors so that these assets can continue to develop according to needs.

With good cooperation and preparedness from various parties, asset management in CSRRP projects is expected to run smoothly and sustainably, providing long-term benefits to affected communities.

In general, institutional collaboration in CSRRP is essential to ensure that each stage of project implementation is effective and sustainable. Key factors supporting this collaboration's success include clear regulations, institutional readiness, clear division of roles, and structured communication and coordination mechanisms. In the stages of managing social and environmental safeguards, issuing licenses and certificates, handling complaints, and managing assets, collaboration between stakeholders plays a crucial role.

Presidential instructions and related regulations are a strong foundation in carrying out each stage of the project, supported by the active role of local governments, institutions, consultants, and communities. Asset management becomes an important challenge in the final stage, which requires the readiness of local governments and related institutions in terms of budget, human resources, and management systems in accordance with regulations.

With a clear division of tasks, efficient coordination, and support from all stakeholders, the CSRRP project has great potential to achieve sustainability and provide long-term benefits to affected communities in Central Sulawesi.



#### 4.6. Key Factors of Collaboration on Diversity and Sustainability

Here are some of the key factors driving institutional collaboration and sustainability, including:

1. **Presidential Instructions and Local Regulations:** The implementation of presidential directives and governors' decrees specific to Central Sulawesi regarding the rights of disaster victims and disaster management standards plays an important role in defining the legal and operational framework for project implementation. These directives help align activities with national and local policies and ensure compliance with sustainability standards.
2. **Integrated Organizational Structure:** The establishment of an organizational structure that integrates the two directorates of the Ministry of PUPR—Housing and Cipta Karya—in one operational command allows for more efficient and effective resource management and coordination of activities.
3. **Commonality of Understanding and Needs:** Uniform awareness and deep understanding of the needs and challenges in disaster management by all stakeholders ensures that all actions and decisions are taken based on a solid consensus and common understanding.
4. **Communication and Coordination Mechanisms:** The establishment of clear communication and coordination routines between CPMU and PMU facilitates a smooth exchange of information and ensures that all parties are informed and involved in the decision-making process.
5. **Ministry of PUPR Assistance:** Direct and ongoing support from the Ministry of PUPR through consultants and technical advisors assists local governments in increasing their capacity to manage and implement projects with set standards.
6. **Local Government Readiness and Capacity:** The ability of local governments to support and implement these projects, including the management of the resulting assets, is an important factor in ensuring the sustainability and long-term effectiveness of the development initiatives undertaken.
7. **Community Involvement and Capacity** in activities and also management of infrastructure assets

#### 4.7. Compliance and Appropriateness of Program Implementation Principles

In this chapter, we will discuss the compliance and appropriateness of the program implementation principles in the CSRRP project. This analysis mainly focuses on how CSRRP projects successfully comply with international standards related to social and environmental risk management, as well as the application of sustainable construction principles. Key aspects such as **Social and Environmental Safeguard Management, Gender Based Violence (SEA/GBV) Mitigation, Universal Design, Earthquake Resistant Buildings, Eco-friendly Buildings, and Water Sensitive Urban Design** will be elaborated in depth, highlighting the project's success in maintaining a balance between infrastructure development and environmental sustainability, as well as the protection and welfare of disaster-affected communities.

##### A. Management Aspects of Social and Environmental Safeguards



The CSRRP project has performed very well in environmental and social risk management, as evidenced by the results of the Environmental and *Social Audit* (ESA) conducted by the CSRRP *Evaluation and Study Consultant* (ESC) team. The audit shows that the CSRRP project is in full compliance with the Environmental and *Social Commitment Plan* (ESCP) set out in the CSRRP *Loan Agreement* for Loan 8979-ID. Overall, the audit found that the implementation of risk management is in line with international standards, covering important environmental and social aspects integrated at every stage of the project.

1. **Stakeholder Engagement Strategy:** CSRRP implements a comprehensive and inclusive stakeholder engagement strategy that involves relevant parties at various project and sub-project levels. In its implementation, Disaster Affected People (DAPs) who are prospective residents of permanent housing have been involved since the early stages, including data collection, socialization of earthquake-resistant houses, selection of blocks or parcels, and the process of building housing. In addition, meetings are held to form community groups, plan capacity building, and handle complaints and other needs. In certain locations, the local community or *Host Community* also provides input, especially on environmental and social risk management aspects. For example, at the Talise Huntap location, the surrounding community is given the opportunity for entrepreneurship and the hope that new residents can respect local culture.
2. **Environmental and Social Management Phase:** CSRRP has completed all stages of environmental and social management for the seven sub-projects covered under the program. The audit results show that most of the environmental and social documents are in place and conform to the Environmental and Social Management Framework (ESMF) requirements. However, the lack of format harmonization between some documents, such as DELH, UKL-UPL, and RAP, resulted in additional workload for project implementers and consultants. This also resulted in delays in completing some environmental and social documents, even though construction work had already started. However, CSRRP, with the support of its consultants, has endeavored to comply with Indonesian regulations and meet the required environmental standards.
3. **Capacity of Implementing Agencies:** The capacity of CSRRP implementing agencies at the central and local levels is considered adequate, both in environmental and social management, monitoring, evaluation, and supervision of consultants and contractors involved in the project. Implementing monitoring and evaluation is very important to ensure that activities in the field follow the standards and procedures set out in the ESMF. These implementing agencies work effectively in overseeing the entire project process in line with environmental and social commitments.
4. **Risk Mitigation and Public Health:** CSRRP has also implemented comprehensive risk mitigation plans related to labor flow, occupational health and safety (OHS), environmental protection and public health. All these mitigation measures are assessed per the standards required by the ESMF, which ensures that the project not

only focuses on physical outcomes but also safeguards the safety and well-being of the workforce and the communities surrounding the project site. This implementation demonstrates that CSRRP prioritizes safety and social risk as integral to the project.

5. **Land Acquisition and Relocation of the DAPs:** CSRRP has carried out a suitable and appropriate land acquisition and relocation mechanism for the WTB. This process follows the requirements of the ESMF, which ensures that the relocation process is conducted fairly and transparently and considers the needs of the affected communities. Adherence to this land acquisition procedure reflects CSRRP's commitment to provide equal accessibility for all disaster-affected people and ensure that relocation takes place seamlessly without conflict or significant issues.
6. **Feedback and Grievance Redress Mechanism:** CSRRP provides an adequate feedback system and grievance resolution mechanism that complies with SEA/GBV (Mitigation of Gender-Based Violence) standards. This system serves to address community grievances quickly and responsively, providing communities with access to submit project-related inputs or complaints. This mechanism ensures that grievances are addressed effectively and provides credibility and transparency, which is important in maintaining community confidence in project implementation.

In general, the Environmental and Social Audit results show that CSRRP successfully complies with the standards and requirements set out in the ESMF. The implementation of stakeholder engagement strategies, effective environmental management, adequate capacity of implementing agencies, and responsive risk mitigation and grievance management mechanisms are key components that support the success of this program in meeting environmental and social sustainability aspects.

## **B. Application of 5 Principles of Activity Implementation**

In an effort to improve the safety and sustainability of infrastructure, it is important to apply design principles that not only meet technical standards but are also responsive to social and environmental needs. The following table presents details of the "Implementation of the 5 Principles of Activity Implementation" that have been integrated in the process of preparation, planning, and implementation of the program. The five principles include compliance with SEA/GBV standards, universal design, earthquake safety, environmental sustainability, and water sensitivity. Each principle is outlined from the concept and method of implementation, the details of the planning, to the results of implementation, which results in a safe, inclusive, and sustainable infrastructure. This demonstrates our commitment to infrastructure development that not only focuses on the technical aspects but also supports the creation of safe and accessible spaces for all users.

**Table 54. Implementation of 5 Principles of Activity Implementation**

No	Programme Implementation Principles	Preparation	Planning	Implementation	Activity Results
1	SEA/GBV Compliance	Concepts and Methods of Implementing SEA GBV set out in the POM Socialisation of Prevention and Handling of Gender-Based Violence (GBV) & Violence Against Children (VAW),	SEA/GBV-orientated DED and RAB design planning as well as inclusion of women in planning and design and safe layout for women.	Supervision of construction implementation according to Shop Drawings that support SEA/GBV compliance	Implementation of SEA/GBV Compliance Huntap, MCK, Borehole, School Building Infrastructure, reflected in Women-safe buildings and layouts
2	Universal Design Compliance	The Concept and Method of Implementing Universal Design is set out in the POM	DED and RAB design planning that is orientated towards the application of universal design	Supervision of construction implementation according to Shop Drawings that support Universal Design Compliance	Implementation of Universal Design for Public infrastructure, in the form of Disability-Specific MCK / Toilet (Door width, opening direction, MCK facilities), Ramp access in and out (School Building, MCK, Hospital, Government Building), Geometric design of roads and green spaces equipped with sidewalks with adequate Guiding Blocks
3	Earthquake Resistant Building Compliance	The Concept and Method of Implementing Universal Decency is set out in the POM Earthquake-resistant Bangutan Guidelines were also developed and socialised to all elements, especially the WTB.	DED and RAB design planning orientated towards the application of earthquake resistant buildings	Supervision of construction implementation according to Shop Drawing of Earthquake Resistant Building	Application of Earthquake Resistant Buildings for the structural construction of RISHA Huntap, the use of reinforced concrete and steel frames for building structures (MCK, School Buildings, Health Buildings, Government Buildings, Clean Water Infrastructure Foundations, WWTP, IPLT Buildings), preparation of evacuation routes and management and protection of residents and users of public infrastructure.
4	Sustainable Building Compliance	The Concept and Method of Implementing Universal Decency is set out in the POM	Planning DED and RAB designs that are oriented towards the application of Sustainable Building	Supervision of construction implementation in accordance with Shop Drawing Compliance Sustainable Building	Implementation of Sustainable Building for buildings without hazardous materials (Asbestos, Lead/mercury paint), Solar Panel Planning in PJU (Public Street Lighting) Activities and Public Facility Buildings
5	Water Sensitive Urban Design Compliance	The Concept and Method of Implementing Universal Decency is set out in the POM	DED and RAB design planning orientated towards water-sensitive urban building design	Supervision of construction implementation according to Shop Drawing Water Sensitive Urban Design Compliance	Implementation of Water Sensitive Urban Design in Infrastructure with permeable pavement materials both in the Huntap yard and paving blocks on the pavement, Jogging Track, building parking areas, fields and green open spaces, as well as the construction of infiltration ponds, retention ponds to accommodate rainwater runoff and flood control.

## 1. SEA/GBV aspect (Sexual Exploitation and Abuse/ Gender based violence)

In the SEA/GBV Management aspect, CSRRP has implemented mitigation related to



Gender-Based Violence (GBV) and Violence Against Children (VAC) in seven audited sub-projects, including RR Tadulako University, Huntap Talise, IPA Poboya, Huntap Bangga Dusun 2, Huntap Tompe 1, 2, 3, Huntap Wani 1, and Huntap Lompio Infrastructure. All of these sub-projects have integrated GBV and VAW mitigation in their environmental and social management

documents, namely the Environmental and Social Management Plan (ESMP) and the Community Social and Environmental Management Plan (CSEMP). In addition, training and socialization have been provided to workers and communities to increase awareness and skills in addressing GBV and HVC issues. The implementation of this program is directly supervised by TMC 1 and TMC 2, with complete activity reports.

In the construction aspect, the application of SEA/GBV management is also realized in design planning that takes into account the safety and comfort of women. Some infrastructure, such as Huntap, MCK, Borewell, and school buildings, are designed with a layout that is safe for women. The inclusion of women in the planning and design process is an important part of ensuring that the layout of public facilities supports an inclusive and safe environment for all users.

## 2. Universal Design

The application of **Universal Design** in CSRRP projects is carried out thoroughly, especially in public infrastructure. Some of the infrastructure designed with the concept of Universal Design includes **MCK** or **special toilets for disabilities**, which pay attention to the width of the door, the direction of the opening, and MCK facilities that are tailored to the needs of disabled users. In addition, adequate **access ramps** to enter and exit **school buildings, restrooms, hospitals, and government buildings** have also been implemented. The geometric design of roads and **green open spaces (RTH)** also has sidewalks with **guiding blocks** to facilitate navigation for people with disabilities. The implementation of Universal Design aims to ensure that every infrastructure built can be accessed by all levels of society, including those with special needs.



Disability Access Ramp, Donggala  
Kodi Elementary School, Palu



Disability toilet, SMP 9, Sigi



Sidewalk *Guiding Block*, Petobo  
Huntap, Palu

## 3. Earthquake Resistant Building



An earthquake-resistant building is a type of construction that is designed to remain standing or suffer minimal damage during and after an earthquake. These structures take into account the dynamic forces and vibrations generated by earthquakes, with the main objective of protecting the safety of occupants and reducing structural damage. All of the infrastructure built in **CSRRP** projects essentially applies earthquake-resistant building principles. One example is the **RISHA Construction Structural Design** used for **Huntap**, as well as the use of reinforced concrete and steel frames for other important building structures, such as **MCK**, **school buildings**, **health buildings**, and **government buildings**, as well as the **foundations of clean water infrastructure**, **WWTP**, and **STP buildings**. In addition to the application of earthquake-resistant designs and materials, the buildings are also supported by the preparation of good evacuation routes and evacuation management to protect residents. Public infrastructure is also ensured to be optimally utilized when a disaster occurs.



Structure of RISHA Huntap Talise, Palu



Reinforced Concrete Structure,  
Anatapura Hospital Cassowary Building,  
Palu



Evacuation route, SMP 19  
Sigi

#### 4. Eco-friendly Building



Solar Cell PJU,  
Petobo Huntan.

The application of green building in CSRRP projects emphasizes the use of non-hazardous materials and designs that support sustainability. This construction does not use hazardous materials such as asbestos and lead/mercury paint. In addition, the concept of environmentally friendly buildings is realized through the use of **PJU solar panels** for lighting and a residential wastewater management system using **SPALDT** (Integrated Domestic Wastewater Management System). With the application of these technologies, the buildings constructed in the CSRRP project are not only environmentally friendly but also contribute to the reduction of negative impacts on the ecosystem.

#### 5. Water Sensitive Urban Design

The CSRRP project also adopted a **water-sensitive urban design** to mitigate the negative impacts of the hydrological cycle that often result in flooding. This design is implemented through the use of **permeable pavement materials** such as paving blocks on sidewalks, jogging tracks, and building parking areas. In addition, **green open spaces (RTH)** are also designed using materials that support rainwater absorption. Retention ponds are also constructed to accommodate rainwater runoff and control flooding. With these measures,

CSRRP ensures that the built city is able to reduce the risk of flooding, creating a safer and more sustainable environment.



Permeability of South Sibalaya Huntap yard, Sigi



Talisa Huntap Retention Pond, Palu



Infiltration Wells, Loli Londo Green Space, Donggala

In general, in terms of compliance and suitability of program implementation principles, **CSRRP has successfully applied various sustainable construction principles** that prioritize safety, environmental sustainability, and the welfare of affected communities. In terms of **earthquake-resistant buildings**, all infrastructure built, including **Huntap**, public facilities, school buildings, health buildings, and government buildings, have been designed with structures that can **withstand** earthquakes to protect the safety of residents and users. In addition, CSRRP demonstrates a commitment to **environmentally friendly building** by eliminating the use of hazardous materials such as **asbestos** and **lead/mercury paint** and using solar panel technology and sustainable wastewater management systems. In terms of water-sensitive urban design, the project integrates measures to reduce the impact of flooding by using permeable pavements, constructing retention ponds, and creating green open spaces designed to accommodate stormwater runoff. Overall, CSRRP successfully created a safe, environmentally friendly, and sustainable environment, focusing on disaster mitigation, environmental efficiency, and community welfare in Central Sulawesi.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1. Conclusion

1. That in general this project is quite efficient and effective, the indication is that the process is running as it should, shortcomings occur in the achievement of KPI considering that there are several activities that have not been declared completed, so that it cannot show the final performance of the project.
2. WTB's profile is dominated by women (57%), the highest education of 48.5% is high school, the average income < from Rp 2,000,000,-
3. In general, this project has provided benefits for both shelter beneficiaries and residential infrastructure and public facilities, these benefits are shown by better public accessibility to shelter services and safe public facilities, where almost 100% state that earthquake-resistant buildings both in shelters have provided a sense of security and comfort and are equipped with basic facilities and inclusive facilities.
4. Overall CSRRP investment is Efficient, Feasible and Useful, Project Efficiency Analysis (US\$150 million), carried out against the actual cost of US\$ 135,837,791.24 (91%) from the allocated cost), projected 17 years, Discount Rate 10%
  - a. Component-1 Investment: US\$ 83,405,080.42
  - b. Component-2 Investment: US\$ 37,137,986.95
  - c. Component 3: US\$ 15,294,723.86
  - d. Total Investment + OM: US\$ 2,240,760,997
  - e. Total Benefit: US\$ 6,848,283,525
  - f. Total Net Benefit: US\$ 4,607,522,528
  - g. Leverage capacity of project assistance funds of 11% \*)
5. Project NPV US\$ 747,017,330 with EIRR 28%, NPV Component 1 US\$ 100,679,022 with EIRR 19%, NPV Component 2 US\$ 656,183,306 with EIRR 34%, For Housing and Residential Infrastructure the NPV is US\$ 92,321,058 with EIRR 18%, for Health Facilities the NPV is US\$ 322,056,632 and EIRR 67% while the NPV education facilities is US\$ 305,577,258 with EIRR 32%
6. Unity Efficiency The type of infrastructure is Cost Efficiency which is the difference in development costs based on the calculation of Engineering Estimate (EE) with the construction cost according to the contract,
  - a. For housing units only, efficiency reaches 24%, houses with PSU per 21%, houses + PSU per sil + other infrastructure 22%, while for residential infrastructure the efficiency is 22%



- b. Efficiency for public facilities reached 24%, assessment of Tadulako University 21%, State High Prosecutor's Office 34%, Undata Hospital 14%, and Fasdiksar 10%
7. Until October 31, 2024, the final target has not been fully achieved, of the 21 indicators, 10 (47%) have been achieved, namely in 1 PDO indicator and 9 Intermediate Result indicators, while 2 *PDO indicators* and 9 Intermediate result indicators have not been achieved. Overall, PDO is projected to be achieved in early December 2024, along with the completion of all physical works and activities that have not achieved KPI due to several activities that have not been completed, including the Poboya IPA, the Palu and Sigi pipeline networks and several public facility buildings (BNN & Sigi Regent office) and the full functioning of SITABA.
8. Key Factors Target achievement includes:
  - a. Presidential Instruction Number 10 of 2018 and Number 8 of 2022, especially related to data collection
  - b. Governor's Decree on Welfare and also Regent/Mayor Decree on WTB and occupancy
  - c. The readiness of the Housing PMU and PMU Cipta Karya which is supported by BPPW, BP2P and also all related Satker and PPK
  - d. Capacity and Readiness of the Regional Government in determining the WTB Decree and the Occupancy Decree and also in the issuance of PBG and SLF
  - e. Land acquisition
  - f. Assistance from TMC 2, TMC 1 coordinated by PMC
  - g. Capacity and speed of the Contractor in building facilities and infrastructure
9. ESC conducted its own assessment with different methods and parameters, the assessment was carried out only on the sample in 226 shelters with complete and occupied facility status, while the KPI calculation was carried out on 3880 shelters both complete and occupied, or not based on the results of the Observation of Quality and Infrastructure Functionality on a sample of 226 shelters that were complete and declared complete, That overall the quality of the Huntap Infrastructure is 95% considered good, 89% of the shelter is also considered to have functioned well. So it can be assumed that if the physical work of all shelters has been completed, completed and occupied, has the potential for KPIs to be achieved.
10. Based on the results of the quality observation of public facilities in 9 public facilities, 97.95% are considered to be of high quality, Based on the results of the quality observation of public facilities in 9 public facilities, 93.76% are considered to be functional with ESC assessing the effectiveness of public facilities based on indicators that refer to KPIs but with different methods and parameters, observation is only carried out on 9 public facilities. Assessed as 100% having met the parameters referring to the KPI
11. Key Factors Achievement of construction effectiveness and quality targets:

- a. Planning; Project management related to multi-stakeholder integrated planning coordination (project owners, local governments, consultants, beneficiaries, communities) related to the process starting from initial planning, land provision, design and changes. Example: Infrastructure related to Huntap utilities has not been completed (Drinking water supply system, waste system) but occupancy has been carried out.
- b. **Implementation**
  - Availability of skilled labor in the right amount according to the target time.
  - Safe work environment. Example: there is a rejection and termination of local work such as in Tompe, so that there is a termination of work by the local community who claim ownership)
  - Unstable soil construction management (Decline in construction due to land shifting) Example: Huntap Tondo
  - Quality and Material Test.
  - Control and monitoring of construction implementation.
- c. **Maintenance**
  - For public infrastructure, the asset maintenance process is constrained by the handover mechanism
  - For residential infrastructure, the legality of O&P, maintenance plans and actions and financing are minimal.

12. In general, Institutional Structuring in achieving CSRRP targets:

- a. Not Effective for the achievement of KPI targets, especially PDO 1 and 2, KPI 1.1; 1.3, 1.4; 1.8; 2.1; 2.2; 2.3; 2.4 and 3.1
- b. Effective in terms of WTB Identification, Land Acquisition, Social and Environmental Safeguards, PBG & SLF, Complaint Handling and Asset Management, Institutional Arrangement in general is shown by:
  - 1) The existence of institutions such as guidelines/regulations such as Presidential Instruction 10 years 2018, and number 8 of 2022, the existence of POM, ESMF, etc.
  - 2) The existence of an organizational structure and the division of tasks and functions between fields both in SEP and in POM as well as good implementation

13. Key Factors of Collaboration and Sustainability Assurance;

**a. Institusi:**

- 1) Presidential Instruction related to Presidential Instruction Number 10 of 2018 and Number 8 of 2021
- 2) The development of guidelines/rules related to the implementation of CSRRP such as POM, ESMF, POS, Modules for each stage of work implementation

helps ensure smooth and compliance with operational standards, which is very important to support the success and sustainability of the program.

- b. **Organizational Structure**; The existence of a CSRRP organizational structure that is under one CPMU command, combining 2 directors general of Housing and Creative Works of the Ministry of PUPR along with the division of their roles as stated in the SEP and POM
- c. **Equal needs** among stakeholders in the provision of land to deal with disasters
- d. **Mechanism of Regular Communication and Coordination** between stakeholders by CPMU and PMU
- e. **Formal and interpersonal assistance from the Ministry of PUPR to Regional Governments** through PMC, TMC, and OSP Assistance Consultants
- f. **Readiness and capacity of the Regional Government** in providing support for the implementation of CSRRP and in managing assets
- g. Community Involvement and Capacity in activities and also management of infrastructure assets

14. **In terms of compliance, social and environmental safeguard management** and the application of 5 principles of project implementation:

- CSRRP has complied with and **in accordance** with the Environmental and Social Commitment Plan (ESCP) contained in the Loan Agreement (CSRRP) for Loan 8979-ID CSRRP
- In terms of Gender-Based Violence Mitigation (KBG) and Violence Against Children (KTA), the results of the ESA show that at the Sub-Project level, KBG and KTA mitigation have been carried out. The KBG and KTA Mitigation Plans have been included in all environmental and social management documents (ESMP and CSEMP). In the construction aspect, the implementation of SEA/GBV management is also applied in infrastructure design planning in the form of women's involvement in planning and design and layout that is safe for women
- The application of Universal Design in CSRRP has been applied in many types of infrastructure, especially public infrastructure, in the form of special toilets for people with disabilities (door width, opening direction, toilet facilities), ramps for entrance and exit access (School Buildings, Toilets, Hospitals, Government Buildings), geometric design of roads and RTH equipped with sidewalks with adequate Guiding Blocks
- The application of environmentally friendly buildings (Sustainable Building), in addition to the absence of hazardous materials used in all CSRRP constructions ((Asbestos, lead/mercury paint), the application of environmentally friendly buildings is also found in PJU solar panels, and Residential Wastewater Management through the SPALDT system
- Regarding earthquake-resistant buildings, this is the main aspect of the building, applied in the structural design of RISHA Construction for Hantap, the use of

reinforced concrete and steel frames for building structures (MCK, School Building, Health Building, Government Building, Clean Water Infrastructure Foundation, WWTP, IPLT Building)..

- The application of water-sensitive urban design in CSSRP Infrastructure is applied to several constructions, namely the use of permeable pavement materials both in the Huntap yard and paving blocks on the sidewalks, Jogging Tracks, building parking areas, fields and RTH (Green Open Space), as well as the Construction of Surmur Infiltration, Retention Ponds to accommodate rainwater runoff and flood control.

## 5.2. Recommendation

### 1. Program Benefits Aspects;

- a. In order to get better satisfaction for beneficiaries and public facilities, in the future it is necessary to improve the quality of services during construction and post-occupancy as well as the quality of infrastructure built by conducting two-way and intense communication with beneficiaries, as well as more intensive project control in terms of time and quality.
- b. To maintain satisfaction and at the same time increase the benefits of the Program, what must be done is to maintain the infrastructure that has been built by immediately handing over both to the community and to the Regional Government and other final recipients, so that it can be immediately utilized and maintained as well as possible.

2. **Program Efficiency Aspects;** Based on the results of economic analysis, this program was declared efficient and useful. The value of efficiency and the value of benefits that have been achieved are carried out with certain assumptions. In the future, the value of the efficiency of rehabilitation and reconstruction programs can be further developed, especially in terms of calculating the direct benefit value of earthquake-resistant buildings.

3. **Program Effectiveness Aspect:** Accelerating the completion of delayed activities to meet all KPI targets in accordance with Presidential Instruction No. 8 of 2022, through more intensive coordination and communication between all relevant parties.

4. **Aspects of the effectiveness of institutional structuring;** The implementation of the **Rehabilitation** and Reconstruction program does involve multi-actors and multi-stakeholders, on the one hand this is part of collaboration, but on the other hand it can hinder the effectiveness in terms of time in the implementation of activities. This is shown by the slow achievement of program KPIs. Therefore, it is necessary to prepare an institution that is much more effective and efficient and also improve coordination and communication in rehabilitation and reconstruction.

### 5. Aspects of Institutional Collaboration and Sustainability Assurance;

- a. Institutional collaboration can only occur if each party fully understands the division of duties, therefore documents such as the SEP (Stakeholder Engagement Plan) and also POM become documents that effectively bind actors to carry out their responsibilities by continuously increasing the capacity of actors

- b. **Sustainability of Asset Management:** The readiness to receive assets by the Palu City Government and Sigi Regency is considered not fully ready. Adjustment of regulations regarding capital participation for the management of SPAM by Perumdam Avo Palu City as well as regulations on the management and determination of waste service tariffs for TPS3R Sigi. Meanwhile, the Donggala Regency Government has been considered more ready to receive assets, especially for the infrastructure of the Huntap Tompe settlement. However, the Tompe Village KPP is not fully ready to manage assets, considering the unavailability of budget for operation and maintenance and the lack of strengthening the capacity of human resources for community-level managers. (readjusted to No. 4 above).
6. **Compliance Aspects of Social and Environmental Security Management;**

  - a. **Social and Environmental Security:** Improve the implementation of social and environmental security to not only meet administrative requirements but also ensure the safety and sustainability of the project for all parties.
  - b. **Application of 5 principles of activity implementation;** It is very good to apply in relation to the inclusivity of the infrastructure built and also ensure sustainability in environmental aspects. For future programs, it can be applied by setting it as a separate project document.
7. **Development Model:** Adopt a CSRRP approach that focuses on resilience, resilience, and inclusivity as a model for similar projects in the future, with improvements to institutional structuring for better effectiveness.

## APPENDIX

### 1. Economic Analysis

#### Ringkasan

***CSRRP investment as a whole is efficient, feasible and beneficial.*** As of October 11, 2024, CSRRP has financed 3 financing components amounting to 91% of the total allocation of US\$150 million, namely; 1) financing for the development of permanent housing and residential infrastructure (61.4%/92%), 2) financing for the rehabilitation and reconstruction of public facilities (27.3%/91%), and 3) financing to support project implementation (11.3%/83%). Using the 10% interest rate as the discount rate on the 17-year investment period, as well as assuming an OM of 10% in the first year and increasing every year, the project's benefit-to-cost ratio is 3.06 ( $>1$ ), current net value (NPV) is \$747,017,330 (positive), the return rate is 28% ( $>10\%$ ). Based on these figures, CSRRP investment is efficient, feasible and useful. The results of this analysis will not change significantly to the absorption of the remaining financing allocation of 9% until the end of the project.

***The leverage capacity of the project assistance fund is 11%.*** The leverage capacity is 11%, meaning that US\$1 of aid/loan funds brings US\$0.11 of partnership funds sourced from the Government, Local Governments and Communities in the form of land provision.

#### Project Objectives

1. The expected outcome of the project is to rebuild and strengthen safer public facilities and housing in the areas affected by the damage. In addition to rebuilding, rehabilitating, and repairing damaged public facilities in the damage-affected areas of Central Sulawesi, the project also rebuilds permanent housing units and residential infrastructure.

#### Efficiency

1. Efficiency is a measure of how economical resources and inputs are converted into results. For development projects, whether the costs incurred to achieve the project objectives are reasonable compared to the benefits and applicable norms. The extent to which the project achieves benefits (outputs, outcomes, and impacts) as much as possible with certain inputs or costs (IEG-World Bank Group, Last Revision: May 2024).
2. NPV and IRR/EIRR CSRRP have been estimated at the project valuation in PAD, resulting in a Project NPV of US\$159,991,945 and an EIRR of 25%. In this Final Evaluation, the calculation was recalculated based on the information available at the time the CSRRP will end, presenting updated data as realized, and at an actual cost percentage of 91% of the total allocated project cost of US\$150 million.

3. The efficiency analysis in this final evaluation uses a cost-benefit analysis to estimate the net benefit arising from the entire project cost. The unit of analysis is the project, by observing the costs and benefits of the sub-project (activity) under each of the project components. The goal of this analysis is to calculate the Net Present Value (NPV) and Economic Internal Rate of Return (EIRR) from the Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP).

## Project Cost

1. Table 55 summarizes the cost of each component and whether it is included in the economic analysis. Investment expenditure is assumed to be based on the realization of project costs incurred in 2019-2024, operating and maintenance costs are calculated over 11 years from 2025 to 2035 are assumed to be 10 percent of investment expenditure in 2025 (the first year of utilization) and increase annually at an adjusted rate of increase for each type of building (see description of Operation & Maintenance/O&M below).
2. The total actual cost of CSRRP as of October 11, 2024 is US\$ 135,837,791.24 (91% of the Total Allocated Cost of US\$ 150 million). An efficiency analysis (B/C, NPV and EIRR) of a total investment of US\$150 million was carried out on all of these actual costs, including the actual cost of Component 1 of US\$83,405,080.42, the actual cost of Component-2 of US\$37,137,986.95, and the actual cost of Component-3 of US\$15,294,723.86.
3. There is other financing outside of assistance/loans in the form of land provision from the government, local governments and communities that is not included in the calculation of investment/project costs (as well as in the calculation of the increase in the value of its benefits) which is US\$15.05 million. The value of the land is considered in the calculation of the leverage of the assistance fund.

**Table 55. Components Included in Economic Analysis**

COMPONENTS & ACTIVITIES	
<b>Component 1. Resilient construction of permanent housing units and settlement infrastructure</b>	Y a
1.1. Construction of settlement infrastructure in new locations	Y a
1.2. Civil works - construction of housing units	Y a
1.3. Community-based reconstruction of housing units and community-scale settlement infrastructure in Central Sulawesi	Y a
<b>Component 2. Resilient reconstruction and strengthening of public facilities</b>	Y a
2.1. Education Facilities	Y



COMPONENTS & ACTIVITIES	
	a
2.2. Health Facilities	Y a
2.3. Other Public Facilities	Y a
<b>Component 3. Project Implementation Support</b>	Y a

## Project Benefits and Methodology

1. This section details the Cost-Benefit Analysis (CBA) methodology. The main objective is to evaluate the economic benefits of CSRRP, through the analysis of the costs and economic benefits of Component 1 and Component 2. The analysis yielded two main outputs, namely; *Net Present Value* (NPV) and *Economic Internal Rate of Returns* (EIRR).
2. The cost-benefit analysis refers to the economic analysis approach that has been carried out at the beginning of the project (presented in Annex-3 of the PAD under the heading Economic Analysis) which relies on principles derived from *the World Bank's Triple Dividend of Resilience Framework* (TDRF). The TDRF outlines three potential development benefits of investing in disaster risk management before the event occurs (*ex-ante*). The ESC economic benefit analysis focuses on 2 types of 3 types of potential benefits:
  - a. **Avoid losses when disasters occur.** This includes saving lives and reducing the number of people affected, minimizing direct costs for infrastructure and other assets, and reducing direct and indirect economic losses. *This economic analysis focuses on the benefits of avoiding the risk of death, and avoiding the risk of loss of damage due to disasters.*
  - b. **Stimulating economic activity due to reduced disaster risk.** In the PAD, it is conveyed that risk reduction can inspire investor confidence, expand the horizons of corporate planning, and increase land value. *This economic analysis focuses on the economic activities of households, beneficiaries of permanent housing and services of clean water/drinking facilities as well as other settlement infrastructure.*
  - c. **Additional benefits from the development, or use, of a particular DRM investment.** For example, increased community-based disaster preparedness can lead to increased women's involvement in community-level activities, strengthening DRM capacity can lead to better governance and more organized social structures. *On this occasion, the economic analysis of additional benefits was not carried out, a qualitative*

*picture of some of the forms of additional benefits is contained in the results of the study of the capacity of local governments in disaster management.*

3. Based on the World Bank's TDRF principles, the analysis of the economic benefits of CSRRP investment in this final evaluation focuses on;
  - a. **Benefits related to future disaster events.** Losses that can be avoided when a similar disaster occurs, namely; (a) avoid the potential risk of death (saving lives), and (b) avoid the potential risk of loss and damage due to disasters.
  - b. **Benefit through "with" and "without project" scenarios.** These benefits include; (a) the benefits of recovering the potential loss of wages due to the damage to the building of basic education facilities (schools) which have an impact on the graduation rate of students are associated with the potential wages that will be lost, and (b) the benefits of recovering the potential loss of healthy days due to the damage to health facility buildings are associated with the potential loss of wages per day;
  - c. **Benefits that are detached or unrelated to future disasters.** Stimulating household economic activity due to reduced disaster risk and improved access (at least recovery) to basic settlement infrastructure for beneficiaries who obtain permanent resettlement services to new locations. These benefits include those obtained by beneficiaries outside the permanent housing construction site related to the construction of drinking water facilities, waste disposal and garbage. The benefits of Public/Green Open Space and Meeting Buildings are not estimated given data limitations.
4. **Data Source:** data input used for economic analysis (CBA/BCA) is sourced from the project cost realization report, the report on the number of beneficiaries issued by the Project Management Unit (PMU) through the Project Management Consultant (PMC) for the 2020-2024 period. The input data for benefit analysis is sourced from primary data from the evaluation and study consultant (ESC) beneficiary household survey, secondary data on health profiles, school/education profiles, the state of workers in Indonesia, economic statistics, ESC study results, CSRRP Project Appraisal Document (PAD) and scientific journals.
5. **The overall framework of the Project, Component 1, Component 2, and Component 3.** The unit analyzed was the CSRRP Project by observing the Costs and Benefits of Component 1 and Component 2. Measuring the economic benefits of the construction of permanent housing units and residential infrastructure, water and drinking water infrastructure, and other residential infrastructure that serves beneficiaries outside the shelter, as well as the development of residential environmental infrastructure through community grants under Component 1 financing. For Component 2, the economic benefits analyzed result from the rehabilitation and reconstruction of educational facilities, health facilities and other public facilities. The main principle is to measure the economic benefits

of the resulting building. Component 3 costs are included in the calculation of the aggregation of the Project to be part of the overall financing of the Project, this is because the value of benefits arising from Components 1 and 2 is also supported by financing in Component 3. The calculation of the discount factor is set at an interest rate of 10% according to the assumption of PAD.

6. **Formula, Size and Criteria.** The calculation formula used is a commonly used CBA formula to evaluate cost efficiency and project efficiency. The main goal is to compare all the costs and benefits of an investment. The measures used are Benefit Cost Ratio, Net Present Value (NPV), and Economic Internal Rate of Return (EIRR). NPV or the current net value of a project is the result of the sum of the net value each year that has been multiplied by the annual discount factor at the interest rate and the set investment period. The cost-benefit ratio is the total value of benefits divided by the total value of costs in a set investment period. Meanwhile, the interest rate on economic change is the result of the division of the future value of the project investment divided by the current value. A project is said to be feasible if; a) NPV greater than 0, b) B/C Ratio >1, and c) EIRR > discount rate/interest rate.
7. **Component 1 - Costs and benefits of permanent housing and residential infrastructure.**
  - a. The cost of Component 1 amounted to **US\$83,405,080.42**, consisting of:
    - 1) The cost of building permanent housing and residential infrastructure amounted to **\$67,387,369.84**, consisting of the cost of building permanent housing of US\$45,376,478.32, plus the cost of residential infrastructure at the new location for financing; a) *Construction of Settlement Infrastructure Tondo 2 Area*, Palu City amounting to US\$ 8,339,087.23 (as of October 11, 2024, the allocated contract value is US\$9,416,363.59), b) *Construction of Settlement Infrastructure Talise Area*, Palu City amounting to US\$ 6,784,772.42 (as of October 11, 2024, the allocated contract value is US\$ 6,787,622.98), c) *Construction of Settlement Infrastructure I (Petobo)* amounting to US\$ 4,863,787.56 (as of October 11, 2024, the allocated contract value is US\$ 5,017,815.04), and d) *Construction of Water Treatment Plant 2x30 L/s Poboya for Huntap Tondo 1, Tondo 2 & Talise*, Palu City of US\$2,255,122.01 (as of October 11, 2024, the allocated contract value is US\$2,899,253.12). The benefits of this financing are calculated by adding the value of the benefits of residential construction at the CSRRP location to the value of the benefits of clean water services received by beneficiaries outside the CSRRP location.
    - 2) The cost of building residential infrastructure for *clean*/drinking water services for service areas outside the CSRRP shelter amounted to **US\$6,543,888.34**, consisting of costs for development; (i) Construction of Water Treatment Plant 1x20 L/s for Huntap Duyu, Palu City; (ii) Construction of Bora SPAM IKK Piping Network for Huntap Pombewe, Sigi Regency; (iii) Construction of Water Treatment Plant 1x20 L/s and SPAM Piping Network for Huntap Pombewe, Sigi Regency; (iv)

- Optimization of SPAM Piping Network for Poboya and Huntap Duyu, Palu City;  
(v) Construction of Water Distribution Pipe and House Connection in Palu City;  
(vi) Construction of Water Distribution Pipe and House Connection in Sigi  
Regency.
- 3) Biaya pembangunan infrastruktur permukiman lainnya *untuk* layanan di luar huntap CSRRP (Non-CSRRP) sebesar **US\$6,291,882.16**, terdiri dari biaya untuk pembangunan; (i) Construction of Settlement Infrastructure Tondo 1 Area Phase II, Kota Palu; (ii) Construction of Settlement Infrastructure Balaroa Area Phase II, Kota Palu; (iii) Construction of Settlement Infrastructure Pombewe Area Phase II, Kabupaten Sigi; (iv) Construction of Supporting Infrastructure for Satellite Huntap in Central Sulawesi Province; (v) Optimalization of IPLT in Kota Palu and Kabupaten Sigi; (vi) Optimalization of TPS3R in Kota Palu and Kabupaten Sigi; dan (vii) Construction of Public Facilities and Green Open Space for Satellite Huntap Phase I-B.
  - 4) The cost of developing environment-scale settlement infrastructure through the community grant financing scheme is **US\$2,950,062.38**.
- b. The total value of Component 1 benefits is **US\$1,757,342,195**, sourced from residential and residential infrastructure benefits, namely;
- 1) The household economic stimulus of **US\$21,348,756**, comes from the calculation of income/expenditure of US\$13 per capita per month of shelter beneficiaries (the results of household surveys) multiplied by the number of residential beneficiaries of 12,441 people,
  - 2) The value of the benefit of clean/drinking water services for beneficiaries outside the permanent residence of CSRRP amounted to **US\$ 26,594,324**, derived from the calculation of income/expenditure of US\$3.7 per capita per month (household survey results) received by 8,930 beneficiaries living in Nanumbuku, Vatu, Kinta and Tondo 1 as well as beneficiaries spread across the service area of each clean water facility outside the CSRRP shelter.
  - 3) The value of other settlement infrastructure services such as roads, drainage, public street lighting, IPLT for beneficiaries outside the CSRRP shelter of **US\$27,092,275** comes from the calculation of income/expenditure of US\$12.0 per capita per month (household survey results) received by 15,678 beneficiaries.
  - 4) The value of benefits avoided from the potential risk of building damage losses due to disasters amounted to **US\$ 62,559,917**, which is 80% of the value of investment in housing and residential infrastructure, clean water, and other residential infrastructure.
  - 5) The value of benefits from environmental-scale infrastructure development through *the Community Grant* scheme amounted to **US\$18,913,541**, derived from the calculation of benefits of US\$7.3 per capita per month (household survey results) received by 19,628 beneficiaries.

- 6) The value of the benefit from avoiding the risk of death (*saving life*) is **US\$1,600,833,381**, sourced from the analysis of VSL figures with the number of disaster victims who died in Central Sulawesi in 2018.

**8. Component 2. The cost and benefits of rehabilitation and reconstruction of public facility buildings.**

- a. The cost of Component 2 is **US\$37,137,986.95**, consisting of:
- The cost of rehabilitation and reconstruction of educational facilities amounted to **US\$20,307,746.26** consisting of investment in rehabilitation and reconstruction of Basic Education facilities of US\$2,951,376.63, and rehabilitation of reconstruction of Tadulako University amounting to US\$17,356,369.63.
  - The cost of rehabilitation and reconstruction of Health Facilities of **\$5,100,415.15** consists of investments for the rehabilitation and reconstruction of the Tipo Health Center of US\$ 69,791.08, Undata Hospital US\$ 3,542,773.06, Anutapura Hospital US\$ 1,258,950.51, and Tora Belo Hospital US\$ 228,900.49.
  - The cost of rehabilitation and reconstruction of other Public Facilities amounted to **US\$11,729,825.55**.
- b. The value of the benefit of Component 2 is **US\$5,090,941,330**, sourced from the benefits of rehabilitation and reconstruction of educational facilities, health facilities, and other public facilities, namely:
- The value of the benefit of saving *life* at elementary schools, Undata Hospital, Anutapura Hospital, and Tipo Health Center (the benefit of avoiding the risk of death at Tadulako University and Tora Belo Hospital was not calculated due to limited data on the average number of people who are active per day in the building), which is **US\$5,033,986,659**.
  - The value of the benefit avoided from the risk of building damage loss due to the disaster amounted to **US\$30,471,651**, which was sourced from the analysis of the estimated maximum loss opportunity of 16.5% for educational facility buildings and 19.7% for health facility buildings and other public facilities (see maximum damage estimate below) with the investment value.
  - Assess the potential wage loss recovery benefits (for basic education facilities) using the "with" and "without project" scenarios. The value of potential wage loss recovered due to school rehab is **US\$1,711,767**, sourced from the analysis of the potential wage loss per year of US\$11,188.02 (i.e. 70% of the value of potential wage loss due to school damage) projected to increase every year cumulatively until the 17th year. The 70% assumption is taken from the PAD assumption for the reconstructed school building which still leaves 30% in operation. The economic value of potential wage recovery is calculated from 2019. The figure of US\$11,188.02 is obtained from the calculation of the difference in wage rates for elementary, junior high and high school graduates if there is no project, by taking the 2021 figure (as a proxy, ideally using the 2019 figure). The number of students was taken from the school profile data of SDIT Insan Gemilang Sigi, SMP Negeri

- 19 Sigi, SD Inpres Donggala Kodi Palu City, and Elementary-Junior High School Adventist Palu City
- iv. The value of the benefit sourced from the recovery of the potential loss of healthy days amounted to **US\$24,771,253**, which was obtained from the restoration of outpatient services (for health facilities, except Tora Belo Hospital) using the "with" and "without project" scenarios. The potential recovery value of healthy days of **US\$1,905,481** per year is calculated from 2023, projected constantly until the 17th year. The projection of a healthy day is assumed to be constant because its decline and increase can be affected by varying types of illness and other variables (there may be a pandemic). This value was obtained from healthy days obtained from outpatient services for the age group of 15-64 years at Undata Hospital, Anutapura, and Tipo Health Center of 249,790 healthy days per year<sup>3</sup>. The economic value is obtained from the analysis of the value of daily wages of \$7.63 (sourced from the average wage of the 2021 Indonesian labor condition report).

**Table 56. Potential Lost Wages "Without Project"**

	Learner s	Wage Rate (IDR)	Wages Without Project (Rp)	Wage Difference (Rp)	Total Wage Difference (Rp)
Elementar y School	469	1,986,400.00	1,633,406.00	352,994.00	165,554,186.00
Junior High School	162	2,235,533.00	1,986,400.00	249,133.00	40,359,546.00
Senior High School	61	2,790,116.00	2,235,533.00	554,583.00	33,829,563.00
Total	692				239,743,295.00
Potential Value of Lost Wages recovered (US\$)					<b>15,982.89</b>
70% of the Potential Value of Lost Wages (US\$)					<b>11,188.02</b>

## 9. Component Cost – 3.

Realisasi biaya Komponen 3 yang dihitung adalah sebesar **US\$15,294,724**. Biaya ini terdiri dari; a) Project Management Consultant (PMC) Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) sebesar US\$ 4,242,389.22, b) Technical Management Consultant (TMC) - 1 Central Sulawesi Rehabilitation and Reconstruction Project

<sup>3</sup> The method of calculating healthy days technically refers to the method used in the PAD economic analysis, namely by conducting a simple regression analysis of sick complaint data and outpatient data from Undata Hospital, Anutapura Hospital, and Tipo Health Center in 2019-2023, as well as assuming sick days for 3 days (doctor's recommendation) and interpreting the regression coefficient as a healthy day.



(CSRRP) sebesar US\$ 3,793,555.49, c) Technical Management Consultant (TMC) - 2 Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) sebesar US\$ 2,043,333.67, d) Evaluation and Study Consultant (ESC) Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) sebesar US\$332,902.76, e) Individual Consultant Senior Program Development Specialist sebesar US\$104,796.71, f) Individual Consultant Program Control and Analysis Specialist for Housing Provision Sector sebesar US\$ 102,383.83, g) Individual Consultant Settlement Development Specialist sebesar US\$ 102,812.33, h) Individual Consultant Junior Settlement Development Specialist sebesar US\$45,763.84, i) Non Consultant Service for Oversight Service Provider (OSP) of Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) sebesar US\$4,526,786.02.

10. **VSL.** The value of benefits avoided from the risk of death uses the concept of *value of statistical of life* (VSL) using the 2024 figures, using the "benefit transfer" method<sup>4</sup>, and the elasticity of VSL is the same as PAD. The VSL used for economic analysis is US\$ 1,377,627. There is a difference of US\$ 499,471 (57%) from the figure used at the beginning of the project of US\$ 878,156 see Table 3.2. The VSL rate in the United States is estimated to increase every year. This analysis uses the 2024 estimate adjusted to the final year of the project and to avoid overestimating the value of benefits when using the estimate of the figure at the end of the 17-year investment period, namely 2035, which is the estimated year of the recurrence of similar disasters in Central Sulawesi (in addition, ESC did not conduct an analysis of Indonesia's GDP growth projections until 2035). VSL sensitivity analysis refers to the sensitivity analysis used by PAD (-23% for residential, 100% for Component 2)

**Table 57. VSL Numbers**

Indicator	Project Beginning (2016)	End of Project (2024)
American VSL (US\$)	9,700,000	13,100,000
Indonesia's GDP per capita (US\$)	10,766	14,805
US GDP per capita (US\$)	53,399	66,451
Income elasticity of VSL <sup>5</sup>	1.5	1.5
Estimated VSL Indonesia (US\$)	878,156	1,377,627

<sup>4</sup> The benefit transfer method used refers to the method used in the PAD economic analysis, which is to multiply the VSL of the United States by the exponential result of the ratio of Indonesia's GDP and the GDP of the United States with the elasticity of VSL data collection of 1.5.

<sup>5</sup> VSL revenue elasticity refers to the elasticity figure contained in the PAD of 1.5 as a factor considered in the transfer method. This figure shows that the value of VSL increases with the increase in income, meaning that for every 1% increase in income, VSL will increase by 1.5%, and shows that the avoidance of the risk of death is a superior (luxury) item.



11. **Baseline estimated data is avoided from the risk of death due to disasters.** Baseline data is needed to estimate the number of affected populations and the percentage of that population that has the opportunity to avoid the risk of disasters in the future. The baseline data used to calculate the number of people who are avoided from the potential risk of death due to disasters in permanent residential buildings is data on the death toll in the 2018 disaster of 2,096 people (*historical data*). The baseline data used in health facility buildings is data on the number of hospitalizations per day and health facility employees (Undata Hospital, Anutapura Hospital, and Tipo Health Center) of 1,899; in the educational facility building, the number of beneficiaries of basic education is 2,247 people, and in other public facilities, the combined number of beneficiaries in the High Prosecutor's Office building, PPI2B, BNN, and the Sigi Regent Office is 659 people.

**Table 58. Amount Avoided from Potential Risk of Death from Future Disasters**

Investment Type	Number of Potentially Affected by Future Disasters	% Potentially Preventable dr Risk of Death	Sensitivity (PAD Sensitivity Analysis) <sup>6</sup>	VSL (2024)
Permanent Residence	1,886	80%	-23%	\$1,060,772.76
Education Facilities	2,247	80%	100%	\$1,377,626.96
Health Facilities	1,899	80%	100%	\$1,377,626.96
Other Public Facilities	659	80%	100%	\$1,377,626.96
<p>Estimated number affected by the disaster:</p> <ul style="list-style-type: none"> <li>- Huntap 90% of the 2018 death toll of 2,096 (Pergub Sulteng)</li> <li>- Number of Fasdiksar beneficiaries (PMC Report)</li> <li>- Number of Hospital/Puskesmas Employees (Undata, Anutapura, Tipo) and Inpatients 2020 (source Health Profile 2020)</li> <li>- Number of beneficiaries of other public facilities (PMC Report)</li> <li>- Percentage of potential prevented deaths of 80% is a proxy sourced from Subbiah et al., (2008) in WB (2015) on Damage Reduction related to EWS.</li> </ul>				

12. **Potential damage to a building to calculate the maximum chance of loss.** The probability of *Probable Maximum Loss* from the rehabilitated buildings is estimated using a technical approach. The available reference on the percentage of damage that can be avoided in buildings that have experienced the strengthening of earthquake-resistant structures in Indonesia is limited. The 30% figure is used as an assumption of the percentage of damage for 'non-structural' building components including architectural components etc in the event of an earthquake. The probability of maximum loss is calculated from the multiplication of 30% against the cost of each component that is expected to suffer damage to some typical types of buildings. Table 59 presents the average percentage of loss or maximum chance of loss in the event of a disaster for structural mitigation (structural reinforcement reconstruction) in each type of public facility building and permanent housing built by CSRRP.

<sup>6</sup> ESC used the results of the PAD sensitivity analysis to indicate that VSL, Disaster Probability, and OM are the most important variables in shaping NPV and EIRR. In this analysis, a 44% reduction in VSL for permanent housing (Component 1) was found to still be feasible (but the EIRR was below the PAD analysis results).

**Table 59. Chance of Building Damage in the Event of an Earthquake**

Mitigasi Struktural	Peluang Kerusakan Maksimum (%)
Reconstruction of Education Facility Building	16.5%
Health Facility Building Reconstruction	19,7%
Reconstruction of Other Public Facilities Building	19,7%
Reconstruction of Permanent Housing and Settlement Infrastructure	20%

13. **The percentage is avoided from death.** Estimation of the number of preventable deaths, i.e. the percentage of people who avoid the risk of death for permanent housing, educational facilities, health facilities, and other public facilities using an estimated percentage reduction in damage and physical loss of 80% for households, as a positive impact of structural repairs to buildings, settlements returning to disaster-safe areas, the establishment of early warning with 48-hour *Lead Times* (Tanner, et al., 2015).
14. **Repetition of disaster events.** The estimated time of a similar disaster in Central Sulawesi refers to the results of the analysis of Frastika, et al. (2013) regarding the recurrence of earthquake disasters for magnitude 6.5 in Central Sulawesi, which is between 12 to 18 years. Based on the results of the analysis, the disaster in 2018 is assumed to repeat itself 17 years later, and falls in the 17th year in the investment calculation period (2035).
15. **Estimated O&M Costs, Depreciation and Residual Value**
  - a. The OM cost for housing and settlement infrastructure is 10% of the investment value in the first year, assuming a 20% increase every year from the second to the fourth year, and a 60% increase every year for the fifth to 17th year according to the results of the PAD sensitivity analysis.
  - b. The cost of OM for drinking water facilities and other residential infrastructure that specifically serves beneficiaries outside the CSRRP shelter is assumed to be 10% of the investment value in the first year, an increase of 10% every year from the second year to the 17th year. Likewise, OM for environmental infrastructure (*Community Grant*).
  - c. The OM fee for the school is 10% of the investment value in the first year, up 200% in the second year, and the addition of 650% of the first year's cost to the previous year's cost in the third to the 17th year applies the results of the PAD sensitivity analysis.
  - d. The OM cost for health facilities and other public facilities is 10% of the investment value in the first year, an increase of 400% in the second year, and an increase of 650% from the first year's cost to the previous year's cost in the third year every year until the 17th year according to the PAD assumption.
  - e. Based on the Regulation of the Minister of Finance of the Republic of Indonesia Number 72 of 2023 concerning Depreciation of Tangible Assets and/or Amortization of Intangible Assets, the depreciation rate of building assets is 5% of the acquisition value (investment) with a utilization period of 20 years. The value of the remaining CSRRP assets until 2035 is 50% (this percentage is used as the basis for adjusting the

monthly per capita benefit value in clean/drinking water infrastructure and other infrastructure from the results of household surveys adjusting for the increase in OM costs).

## Results and Discussion: NPV and EIRR of CSRRP Projects

1. **NPV and IRR of the Project.** Using 10% interest rate as the *discount rate* to calculate the discount factor, the benefit and cost ratio of the project for 17 years is 3.06 (>1), NPV is \$747,017,330, EIRR is 27% (>10%) .
  - a. The Total Project Cost is the cost of Components 1, 2 and 3 for 6 years (2019-2024) plus the estimated value of operations and maintenance (O&M) costs for 11 years from 2025 to 2035, so that over 17 years the total project cost is US\$2,240,760,997. These costs are estimated to provide total benefits of US\$6,848,283,525, derived from;
    - i. The value of benefits that are not linked to future disaster events, viz:
      1. The household economy of shelter beneficiaries amounted to US\$21,348,756;
      2. Clean water services outside CSRRP shelters amounted to US\$26,594,324;
      3. Settlement infra services outside CSRRP shelters amounting to US\$ 27,092,275;
      4. The household economy of *community grant* beneficiaries amounted to US\$18,913,541.
    - ii. The value of benefits based on the "with" and "without project" scenarios, namely:
      1. Potential lost wage recovery (SRE) of US\$1,711,767,
      2. Potential recovery of lost healthy days amounted to US\$24,771,253,
    - iii. The value of benefits associated with future disasters is:
      1. Avoided potential disaster damage repair costs of US\$93,031,568, and
      2. Avoided potential disaster mortality risk of US\$ 6,634,820,040.
  - b. The net benefits of the project amounted to US\$4,607,522,528 (the result of subtracting total benefits and total costs). The net benefit value was multiplied by the discount factor at a 10% discount rate for 17 years resulting in an NPV of US\$747,017,330 with an EIRR of 28%.

**Table 60. Summary of NPV and EIRR of the Project, Component 1 and Component 2**

	Project	Component 1	Component 2
<b>NPV (US\$)</b>	747,017,330	100,679,022	656,183,306
<b>EIRR</b>	28%	19%	34%

**Table 61. Summary of NPV and EIRR of Housing and Settlement Infrastructure**

	Housing & Infra Settlement	Community Grant (ISL)	Clean Drinking Water Infrastructure	Other Settlement Infrastructure
<b>NPV (US\$)</b>	92,321,058	2,874,282	2,659,000	\$2,983,057
<b>EIRR</b>	18%	36%	20%	23%

**Table 62. Summary of NPV and EIRR of Health Facilities, Education Facilities, and Other Public Facilities**

	Health Facilities	Education Facilities	Other Public Facilities
<b>NPV (US\$)</b>	322,056,632	305,577,258	28,549,416
<b>EIRR</b>	67%	32%	15%

2. **NPV and EIRR of Component 1.** *Investments in Component 1 are efficient, feasible and worthwhile.* CSRRP has built 3,880 housing units in new locations and settlement infrastructure both inside and outside the shelters. The total investment cost of housing, settlement infrastructure and *community grants*, plus projected operation and maintenance costs over 11 years (calculated from 2025 to 2035) amounted to US\$953,253,927, total benefits amounted to US\$1,757,342,195, net benefits amounted to US\$804,088,268. Benefit-cost ratio of 1.84 (>1), NPV of US\$100,679,022 (positive), EIRR of 19% (>10%).

a. **NPV and EIRR of Housing & Settlement Infrastructure.** *Investment in housing and settlement infrastructure is efficient, feasible and beneficial.* The total investment cost of housing and settlement infrastructure, plus the projected operation and maintenance cost for 11 years (calculated from 2025 to 2035) is US\$909,174,986, the total benefit obtained is US\$1,674,836,881, the net benefit is US\$765,661,895. The benefit-cost ratio is 1.84 (>1), NPV is US\$92,321,058 (positive), EIRR is 18% (>10%).

b. **NPV and EIRR of Clean/Drinking Water Infrastructure.** *Investment in clean water infrastructure is efficient, feasible and beneficial.* The total investment cost of housing and settlement infrastructure, plus the projected operation and maintenance cost for 11 years (calculated from 2025 to 2035) is US\$17,478,717, the total benefit obtained is US\$31,465,992, the net benefit is

US\$13,987,275. The benefit and cost ratio is 1.80 ( $>1$ ), NPV is US\$2,659,000 (positive), EIRR is 20% ( $>10\%$ ).

- c. **NPV and EIRR of Other Settlement Infrastructure.** *Investment in other settlement infrastructure is efficient, feasible and beneficial.* The total investment cost of housing and settlement infrastructure, plus the projected operation and maintenance cost for 11 years (calculated from 2025 to 2035) is US\$17,951,474, the total benefit obtained is US\$32,125,781, the net benefit is US\$14,174,307. The benefit and cost ratio is 1.79 ( $>1$ ), NPV is US\$2,983,057 (positive), EIRR is 23% ( $>10\%$ ).
  - d. **NPV and EIRR of Community Grant.** *Community Grant investment is efficient, feasible and beneficial.* The total cost of community grant investment and maintenance for 11 years (calculated from 2025 to 2035) is US\$ 8,416,872, the benefit earned is US\$ 18,913,541, the net benefit is US\$ 10,496,669. Benefit and cost ratio of 2.25 ( $>1$ ), NPV of US\$2,874,282 (positive), EIRR of 36% ( $>10\%$ ).
3. **NPV and EIRR Component 2.** *Investments in Component 2 are efficient, feasible, and beneficial.* CSRRP has rehabilitated and reconstructed public facilities in the form of educational facilities, health facilities and other public facilities in the form of office buildings. Realized financing for Component 2 amounted to US\$37,137,986.95, consisting of US\$20,307,746.26 for rehabilitation and reconstruction of educational facilities, US\$5,100,415.15 for health facilities, and US\$11,729,825.55 for other public facilities. The total investment value of rehabilitation and reconstruction of public facilities plus the projected operation and maintenance costs for 11 years (calculated from 2025 to 2035) is US\$1,272,212,346, the total benefits are estimated at US\$5,090,941,330. The benefit to cost ratio is 4.00 ( $>1$ ), NPV is US\$656,183,306, EIRR is 34% ( $>10\%$ ).
- a. **NPV and EIRR of Educational Facilities** .The total investment value of rehabilitation and reconstruction of educational facilities plus projected operation and maintenance costs for 11 years (calculated from 2025) is US\$677,263,338, the total benefit is estimated at US\$2,495,090,951, the net benefit is US\$1,817,827,613. The benefit-cost ratio is 3.68 ( $>1$ ), NPV is US\$305,577,258, EIRR is 32% ( $>10\%$ ). *CSRRP's education facility rehabilitation and reconstruction investment is efficient, feasible, and beneficial.*
  - b. **NPV and EIRR of Health Facilities.** The total investment value of rehabilitation and reconstruction of health facilities plus projected operation and maintenance costs for 11 years (calculated from 2025) is US\$180,299,675 , total benefits are estimated at US\$1,860,146,399, net benefits are US\$1,679,846,723.

Benefit-cost ratio of 10.32 ( $>1$ ), NPV of US\$322,056,632 (positive), EIRR of 67% ( $>10\%$ ). *Financing the rehabilitation and reconstruction of CSRRP health facilities is efficient, feasible and beneficial.*

- c. **NPV and EIRR of Other Public Facilities.** The total investment value of rehabilitation and reconstruction of other public facilities plus the projected operation and maintenance costs for 11 years (calculated since 2025) is US\$414,649,333, the total benefit is US\$735,703,981, the net benefit obtained is US\$321,054,648. Cost benefit ratio of 1.77 ( $>1$ ), NPV of US\$28,549,416, EIRR of 15% ( $>10\%$ ). *Financing the rehabilitation and reconstruction of other public facilities built by CSRRP is efficient, feasible and beneficial.*
4. **Capacity to Leverage.** *The leverage capacity of the project grant is 11%.* The leverage capacity is 11%, meaning that US\$1 of the grant/loan brings US\$0.11 of partnership funds sourced from the Government, Local Government and Communities in the form of land provision . In the CSRRP project financing plan, partnership costs are not estimated or designed to implement all components of the planned activities. In implementation, there were other resources sourced from the government, local governments, and communities in the form of land with a value of approximately US\$15.50 million, or approximately 34% of the cost sourced from the loan for shelter construction, 19% of the Component 1 loan cost, and 11% of the overall project loan cost. This contribution of land provision made the project possible.

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- IEG & World Bank Group. (2024). *Guidance Manual for Independent Evaluation Group Validators: Implementation Completion and Results Report Reviews for Investment Project Financing (Last Revision: May 2024)*. The World Bank.
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- Tanner Thomas, Swenja Surminski, Emily Wilkinson, Robert Reid, June Rentschler, & Rajput, S. (2015). *The Triple Dividend of Resilience: Realizing development goals through the multiple benefits of disaster risk management*. Overseas Development Institute (ODI), International Bank for Reconstruction and Development / International Development Association or The World Bank.



## 2. Infrastructure Observation Documentation

### Huntap Mandiri



Huntap Buluri



Huntap Watusampu



Huntap Kayumalue Pajeko

### Huntap Satellite



Huntap Tompe



Huntap Sibalaya Selatan

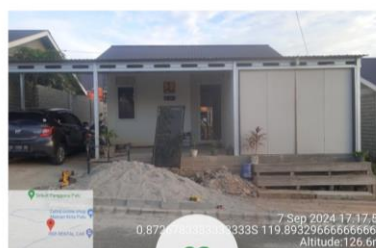


Huntap Wani

### Huntap Kawasan



Huntap Petobo



Huntap Talise



Huntap Tondo

## Jalan Rabat Beton



Huntap Satelite Ganti

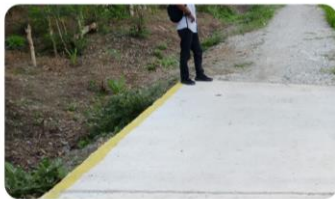


Huntap Sibalaya Selatan



Huntap Loli Tasiburi

## Jalan Beton (ISL)



Sibalaya Selatan



Wani



Tompe

## Jalan Aspal



Huntap Petobo



Wani



Huntap Petobo

## Drainase U-Ditch



Huntap Petobo



Huntap Loli Dondo



Huntap Wani



## Drainase Pasangan Batu



01

Wani Segmen 1



02

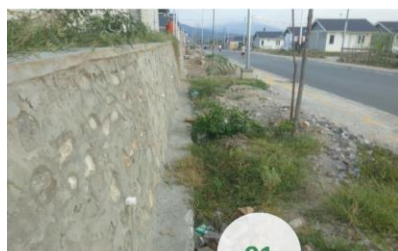
Wani Segmen 2



03

Huntap Wani Segmen 3

## Dinding Penahan Tanah (DPT)



01

Huntap Petobo Segmen 1



02

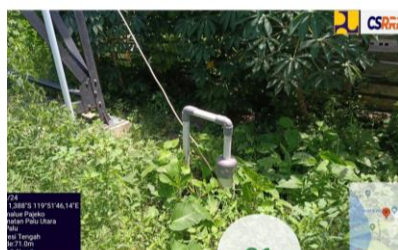
Wani Segmen 2



03

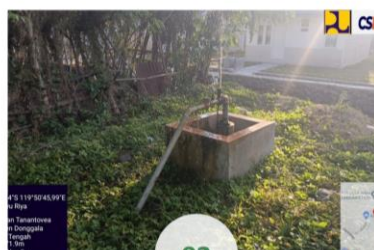
Huntap Petobo Segmen 3

## Sumur Bor Dalam



01

Huntap Kayumalue Pajeko



02

Huntap Wani



03

Huntap Mandiri Petobo

## Perpipaan/SR



01

Huntap Kayumalue Pajeko



02

Huntap Pantoloan



03

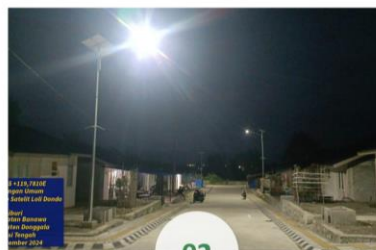
Huntap Wani

## Penerangan Jalan Umum (PJU)



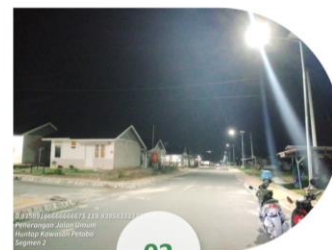
01

Huntap Sibalaya Selatan



02

Huntap Loli dono



03

Huntap Petobo

## SMP 19 Sigi



01



02



03



## SD INPRES DONGGALA KODI



## SD IT INSAN GUMILANG



## SMP ADVENT

