

# Aceh Rehabilitation and Reconstruction, Indonesia: Study Case of Housing Program in Aceh Jaya and Sabang Districts

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*Housing Project to making Aceh Safer Through in Rehabilitation and Reconstruction was a project initiated by Germany Red Cross (GRC) to monitoring and evaluation for the program to know about 'Building capacity Know-How' and 'Culture of Safety' of the housing structure, and therefore it is necessary to know the end-line situation amongst the communities in the project areas. Characteristic of structure from Germany Red Cross Housing Project has found that the building structure made Increase in disaster preparedness from geological hazards (earthquake) and hydro-meteorological hazards (flood and typhoon). The percentage of communities confirming that during earthquake in 2012, the structure not damage is 100%. The end-line study has shown improved situation in Rehabilitation & Reconstruction aspect among communities, study results has shown an encouraging situation regarding housing program aspect considering the fact that the program is useful and communities' self initiatives for extended the houses for rise up economic and disaster mitigation. The main objective of the end-line survey was to measure the strength in the structure of housing program for tsunami disaster victim in Aceh province.*

**Key Words:** increase preparedness, resistant structures, self-initiative

## 1. Background

This study is based on the data of Germany Red Cross (GRC) end-line survey, was conducted in the two districts of Aceh Province: Sabang and Aceh Jaya District. The criteria for selection of study area was district where the Housing Project of GRC had been implemented, as the districts at high risk of disasters.

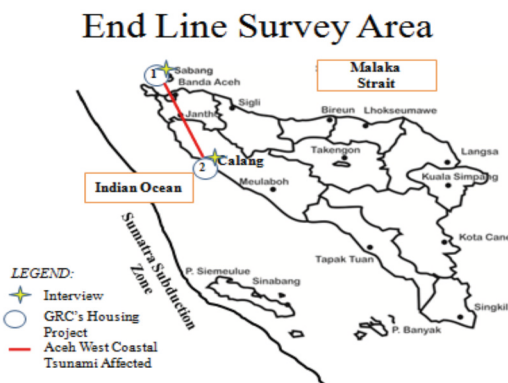


Figure 1. GRC's Housing Project

GRC's end-line survey was conducted for 12 days during end of April and May 2013 by finalization of questionnaires and other survey instruments for the two groups of respondent, development of guidebook for field works, providing briefing to enumerators, ensuring quality control during data collection through supervisions and field inspections for data collection verifications, data editing and processing, and preparation of the survey report. The allocated time for the whole end-line survey was two months in April and May 2013, which was very limited for a large survey involving wider areas and populations. As a consequence, the sample size should be reduced but to meet the desirable size of respondents. However, to ensure the accuracy of the results, the end-line survey has opted for a sampling method that ensures the confidence level of 95%, a 50% response rate, and

a  $\pm$  5% margin of error.

## 2. Method

The scope of the survey is referring to the objective of the end-line survey, the following key topics are covered in the survey implementation: a. Occupied b. Community's satisfied c. Design address concern in trauma (tsunami and earthquake) d. After 5 years e. Specific finding result f. Structure damage during earthquake in 2012 g. In depth interview about housing process, with the six of head villages.

Qualitative research method was applied in this study, the quantitative component is a survey in districts project area GRC implemented. The survey was conducted through face-to-face selected respondent interviews using a structured questionnaire. It solicited information pertaining to know capacity of houses with regards to the aspects above.

Quantitative research method was applied in this study, the quantitative is a primary data of the end-line survey was collected from various groups of respondents: communities and Head villages through face-to-face interviews, in-depth interviews, and observations.

The study teams were mobilized to the designated districts for data collection. They comprised of two teams with three enumerators assigned in each team. One team was assigned to collect data and information from communities and head village in the GRC area project, to selected villages in the two designated districts. In each district a number of three villages were selected (total 6 villages). Blang, Ketapang and Dayah Baro villages in Aceh Jaya District. And Balohan, Krueng Raya and Pria Laot villages in Sabang District

The data entry, data cleaning and data analysis were conducted using the Excel program. The primary data of the survey is the data collected from the respondents through questionnaires. Data from direct observation was also counted up to understand the level of support from the communities and Head Village for rehabilitation and reconstruction program.

The survey implemented two sampling techniques; multistage sampling and purposive sampling. For the community component, the survey used a multistage sampling. Respondents were selected from randomly selected households by considering the representation of Villages member and occupation.

The purposive sampling was implemented to sample Head Village in each village was based on the institutions possessing leading and supporting roles and responsibilities for rehabilitation and reconstruction after tsunami disaster at village level.

### 3. Discussion

The end-line survey took into account the criteria and representation of beneficiaries housing project GRC. This section describes the characteristics of the building houses based on interview of respondents in each village.

#### 3.1 Houses Occupied

Figure 2 shows the proportion of housing occupied in each District.

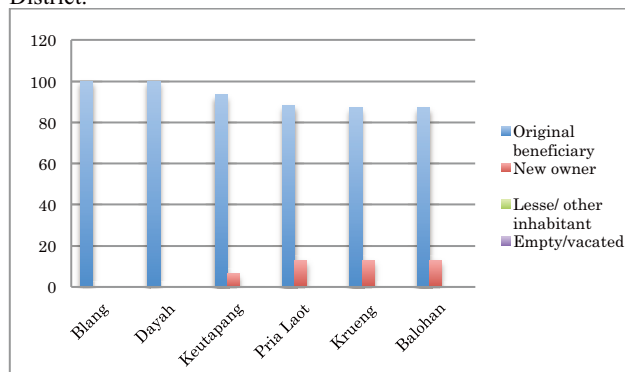


Figure 2. Housing occupied

In Sabang District, the percentage of the original beneficiaries is variation in each village. Majority houses are occupied by original beneficiaries. Turned housing by new owners are 13% in the 2 villages.

#### 3.2. Community's Satisfied

Figure 3 shows the proportion of beneficiaries satisfied with the program in each district.

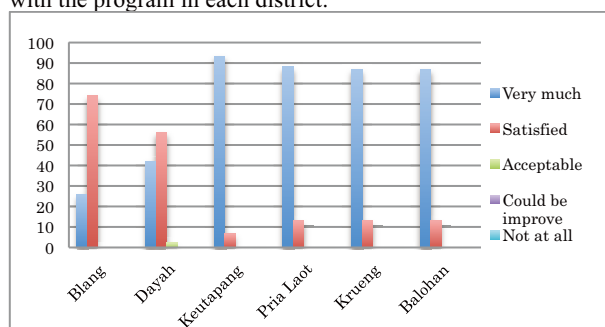


Figure 3. Community's Satisfied

In Sabang District, The percentages of the satisfied beneficiaries are variation in each village. Majority they are satisfied with the project. One village confirmed 50% satisfied with the project.

In Aceh Jaya District, The percentages of the satisfied beneficiaries are variation in each village. Majority they are satisfied with the project. Three villages confirmed could be improved in the project from 4%, 20% to 42%.

#### 3.3 Design address trauma on disaster

Figure 4 and 5 shows design address trauma on disaster. Is the structure of the house lead trauma to the beneficiaries as disaster's victim.

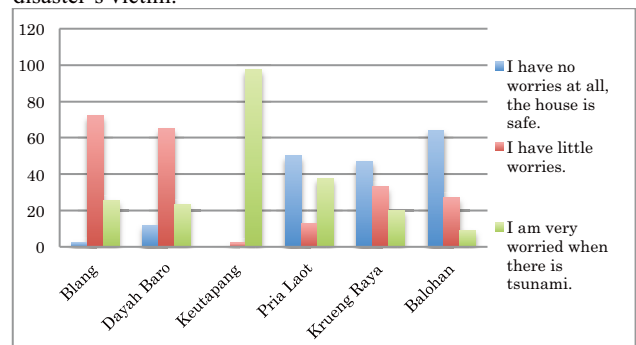


Figure 4. Design address trauma, tsunami

Figure 4 shows, in the three villages in Sabang Island, they had no worries in their house when the earthquake occurred, up to 62%. Otherwise, beneficiaries in the three villages of Aceh Jaya, majority beneficiaries had worries in their houses when the earthquake occurred, up to 70% and very worries up to 97%.

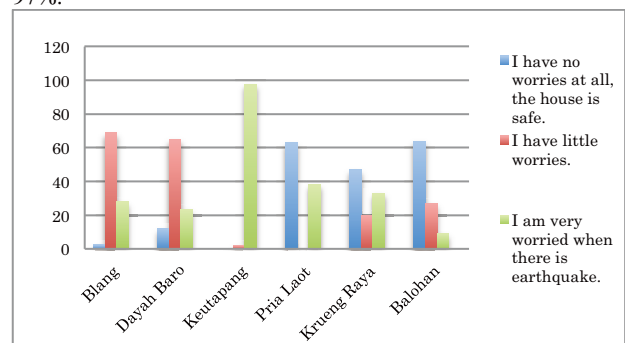


Figure 5. Design address trauma, earthquake

Figure 5 shows, in the three villages in Sabang Island, they had no worries in their house when the tsunami occurred, up to 61%. Otherwise, beneficiaries in the three villages of Aceh Jaya, most beneficiaries had worries in their houses when the tsunami occurred, up to 65% and very worries up to 97%.

#### 3.4 After 5 Years

Figure 6 to 8 shows the proportion of houses condition after 5 years used by beneficiaries. The percentages of the houses conditions are variation in each district.

##### Reinforce Concrete Condition (RCC)

Majority houses conditions in reinforce concrete & structures are no damage visible.

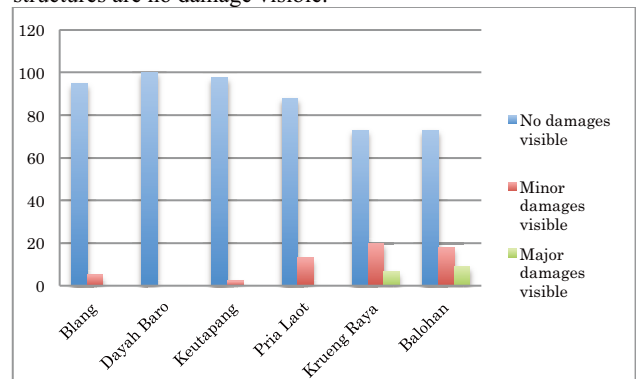


Figure 6. Reinforce Concrete Condition (RCC)

In Sabang District, The percentages of RCC Structure are variation in each village. Majority in the three of villages confirmed from 67%, 73% to 87%, no damage visible in housing structure.

In Aceh Jaya District, The percentages of RCC Structure are variation in each village. Majority in the three of villages confirmed from 95%, 98% to 100%, no damage visible in housing structure.

### Walls

Majority walls conditions in housing project are minor damage visible.

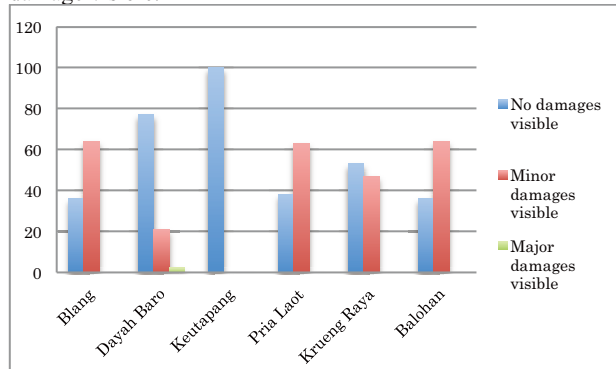


Figure 7. Walls condition

Figure 7 shows, in Sabang District, The percentages of wall condition are variation in each village. Majority in the three of villages confirmed from 47%, 63% to 78%, no damage visible in the wall condition.

In Aceh Jaya District, The percentages of wall condition are variation in each village. Majority in the three of villages confirmed from 36%, 77% to 100%, no damage visible in the wall condition.

### Roof

Majority roof condition in housing project is different in the two districts.

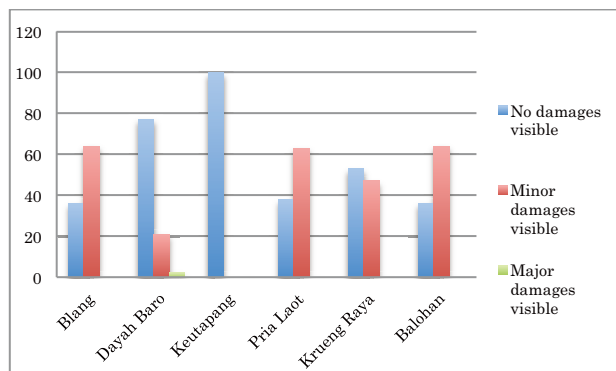


Figure 8. Roof condition

Figure 8 shows, in Sabang District, The percentages of roof condition are variation in each village. Majority in the three of villages confirmed from 50% to 78%, no damage visible in the roof condition.

In Aceh Jaya District, The percentages of roof condition are variation in each village. Majority in the three of villages confirmed from 56%, 67% to 80%, a minor damage visible in the roof condition.

### 3.5 Specific Finding Result

After 5 years, there are some significant differences in each village in Aceh Jaya District. Finding specific result shows in the figures below.

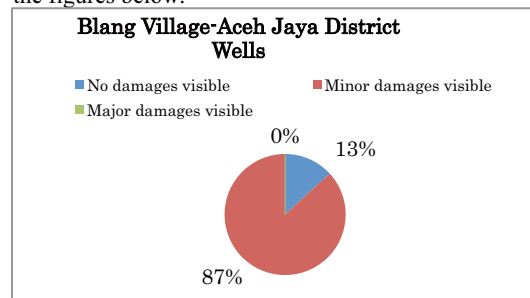


Figure 9. Wells condition in Blang Village District

Figure 9 shows in Blang Village, 87% confirmed minor damage wells in this area.

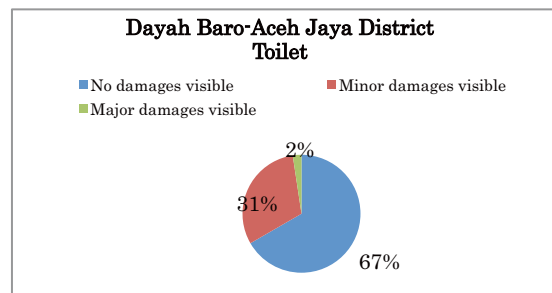


Figure 10. Toilet condition in Dayah Baro Village

Figure 10 shows, in Dayah Baro Village, 31% confirmed minor damage toilet in this area

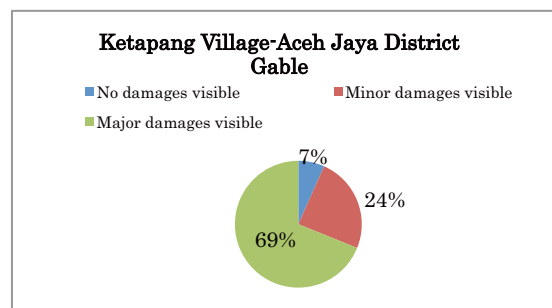


Figure 11. Gable condition in Ketapang Village

Figure 11 shows in Ketapang Village, 69% confirmed major damage gable in this area

### 3.6 During an earthquake in 2012

Figure 12 shows the proportion of houses condition during earthquake in 2012. The percentages of the houses condition in the two districts are the same. Houses during earthquake 2012 are not concrete structure damage in each village.

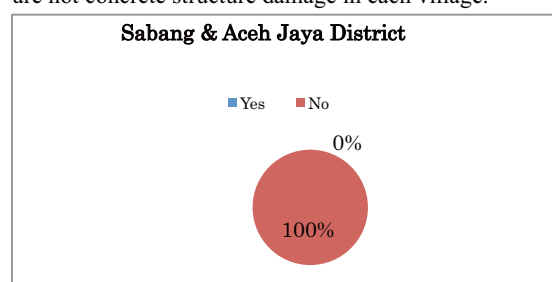


Figure 12. During earthquake 2012

Figure 12 shows housing conditions in the two districts confirmed 100% no damage, during the earthquake 2012.

### 3.7 In Depth Interview with Head Villages

This chapter describes the Head Village opinion and recommendation from each village in the two districts and Head village testimony about GRC Housing Project on Rehabilitation and Reconstruction after tsunami disaster in 2004. Base on the qualitative data collected during the end-line survey. To have an understanding of what opinion, in depth interview have been asked the condition of houses and communities who live in about 1) Informed planning program, 2) Problems, 3) Any tension from different organization, and 4) Satisfied with implementation

### 3.8 Head Village Questionnaire

Base on questionnaire in the six villages in Aceh Jaya and Sabang District, not really differences answer. Percentage of questionnaire shows in figures below.

#### 1a Planning of Houses

Majority head village are satisfied with planning of houses from GRC Project.

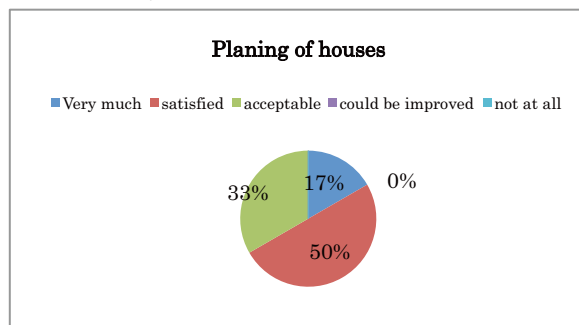


Figure 13. Planning of houses

Figure 13 shows 50% satisfied, 33% acceptable and 17% very much accepted in the planning of houses in Sabang and Aceh Jaya District.

#### Problem Arouse

Majority villages had problem arouse in the earlier of the GRC program implemented.

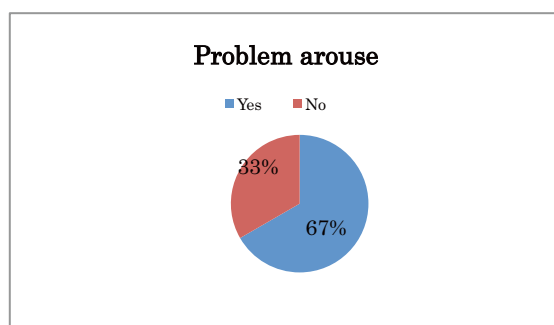


Figure 14. Problem arouse

Figure 14 shows 67% project causes problem arouse in Sabang and Aceh Jaya District.

#### Any tension-Different organizations

Majority villages had no tension problem from different organizations in GRC program implemented.

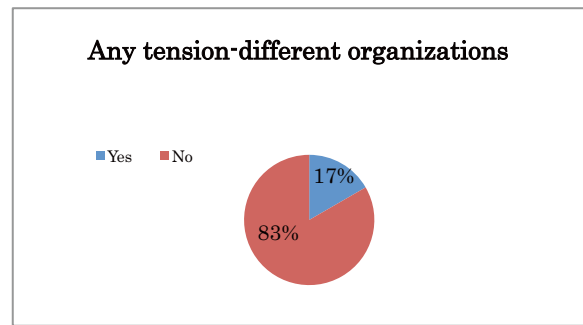


Figure 15. Any tension different organizations

Figure 15 shows 83% no any tension from different organizations in the housing project in Sabang and Aceh Jaya Districts.

#### Satisfied with implementation the method

Majority Head villages satisfied with implementation the method of GRC housing project.

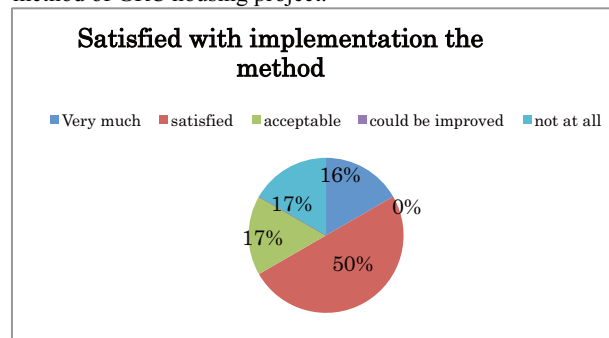


Figure 16. Satisfied with implementation the method

Figure 16 shows 50% satisfied with implementation the method of housing project in Sabang and Aceh Jaya Districts.

## 4. Result

### 4.1 Characteristics of Structure in Aceh Jaya District

Characteristic of structure from Germany Red Cross Housing Project in Aceh Jaya District has found that the building structure made **Increase in community disaster preparedness** from *hydro-meteorological hazards* (flood) because of houses in Second floor. And for *geological hazards* (earthquake).

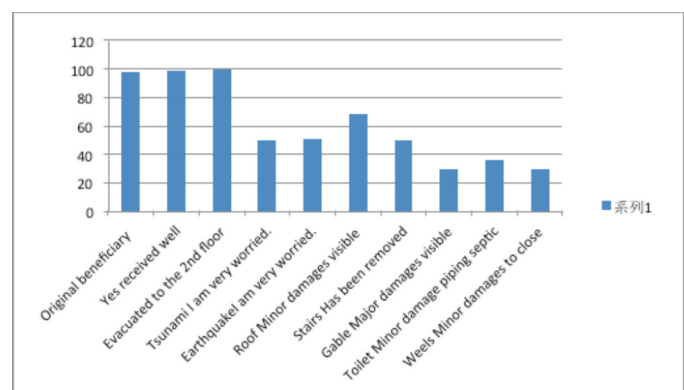


Figure 17. Characteristic of houses in Aceh Jaya District.

Figure 17 shows, the percentage of communities confirming that during earthquake in 2012, the structure not damage is 100%. Structure of gable houses not permanent and

strong enough, make houses risk from typhoon. The other characteristic of structure houses in Aceh Jaya District shown in Figure.2 below.

#### 4.2 Characteristics of Structure in Sabang District

Characteristic of structure from Germany Red Cross Housing Project in Sabang District has found that the building structure made **Increase in community disaster preparedness** from *hydro-meteorological hazards* (typhoon) because of permanent Gable in the structure. For *geological hazards* (earthquake), the percentage of communities confirming that during earthquake in 2012, the structure not damage is 100%. Structure of houses just one floor and there isn't drainage around, make houses risk from flooding in the raining season. The other characteristic of structure houses in Sabang District shown in the Figure 18 below.

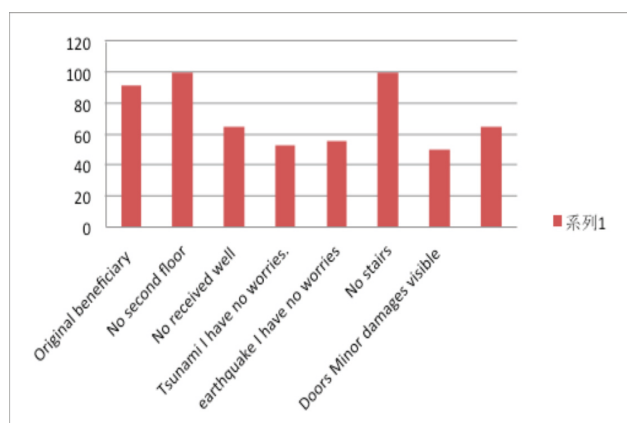


Figure 18. Characteristic of houses in Sabang District

Figure 18 shows, the end-line study has shown improved situation in *Rehabilitation & Reconstruction* aspect among communities. End-line study results has shown an encouraging situation regarding housing program's aspect considering the fact that the program is useful and communities' self initiatives for extended the houses for rise up economic and disaster mitigation.

#### 4. Conclusion

Characteristic of structure from Germany Red Cross Housing Project in Aceh Jaya District has found that the building structure made **Increase in community disaster preparedness** from *hydro-meteorological hazards* (flood) because of houses in Second floor. For *geological hazards* (earthquake).

*Disasters in the survey area* Characteristic of hazards has not changed over time in the survey area. The end-line survey results shows that the survey area remain susceptible to both *hydro meteorological hazards* (flood, typhoon) and *geological hazards* (earthquake, tsunami). Earthquake and tsunami remains the two major disasters in the survey area. Flood and typhoon that occurred most frequently but in the third of hazard.

*Increase in communities public awareness in rehabilitation and reconstruction* The end-line study has shown an observable improvement of communities awareness on disaster risk reduction by "strong housing" in the survey area. It is evidenced by the increase in knowledge, attitude and practices of disaster risk reduction in aspect of disaster prevention, disaster mitigation, and disaster preparedness.

In Aceh Jaya District, houses build base on local contents from structure with second floor can be safe from flood hazard. Also traditional gable as interior of houses, but the materials and installation of gable can be better in the next program, regarding Aceh Jaya area closed from the ocean, typhoon hazard most frequently.

In Sabang District, houses build in first floor, gable construction made by concretes, for the coastal area it can be safe from typhoon hazard, but drainage have to be instal included in the housing complex, anticipated for flooding hazard most frequently.

In end line survey, majority of houses had no damage during earthquake 2011, event the construction strong enough, community awareness to evacuated themselves to the open space.

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