

UNESCO Chairs Webinar World Water Day



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Strengthening Water Resources Management at the Micro Level to Support Sustainable Renewable Energy Availability



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Outline

- Introduction
- Potential water resources for electricity generation
- Advantages and Disadvantages of micro hydro electricity generation
- Case Study : Kincang Micro Hydro Power Plant, Banjarnegara, Central Java – Indonesia
- Discussion
- Conclusion

Introduction

- MHPP (Micro Hydro Power Plant) is a power plant that uses flowing water as its energy source.
- MHPP is an environmentally friendly energy source.
- Its use can be utilized to meet electricity needs in remote areas.
- 131 River area

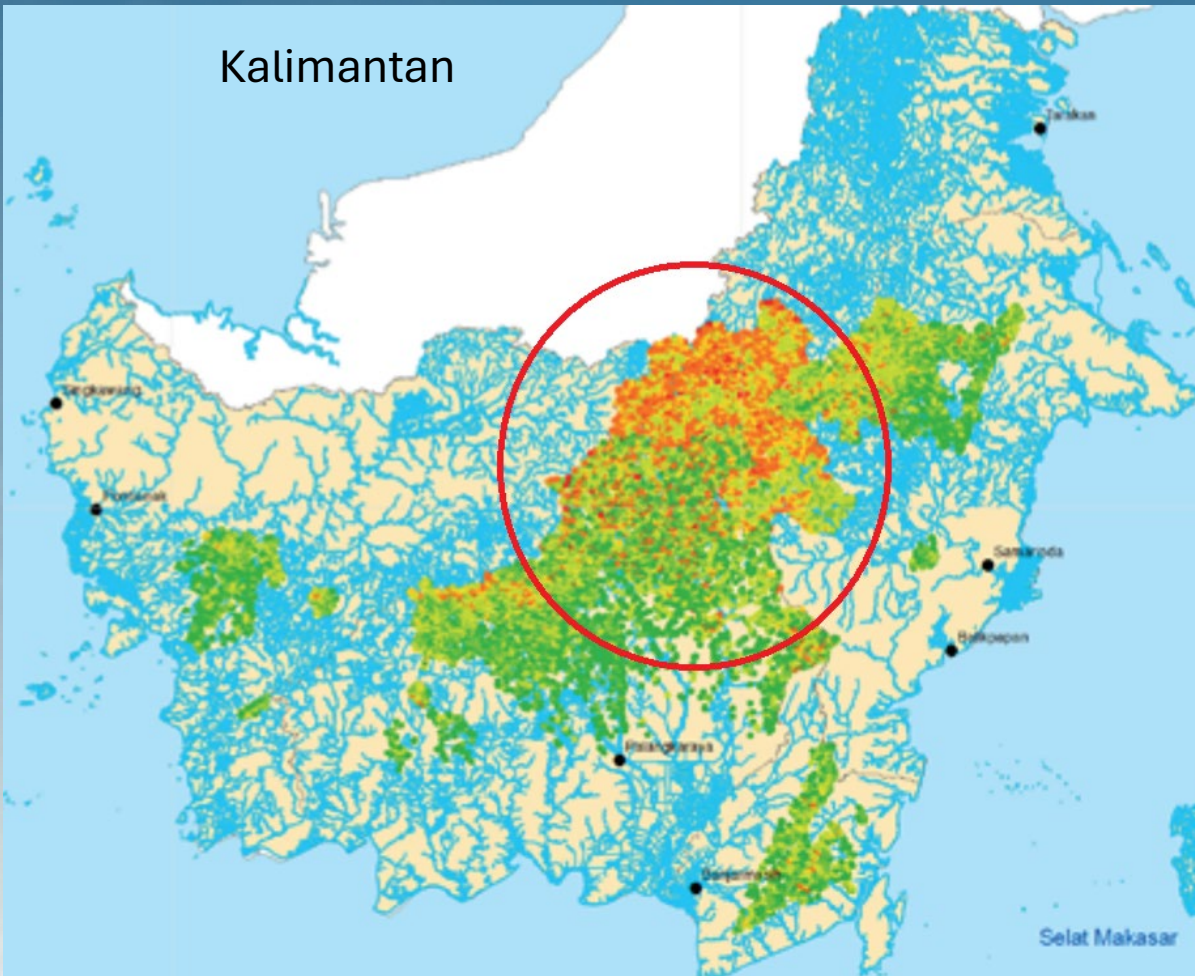


Introduction

- The potential for MHPP in Indonesia is very large because it has many rivers that can be a source of electricity generation.
- According to data from the Indonesian Ministry of Energy and Mineral Resources (ESDM), the energy potential of MHPP in Indonesia reaches around 75 GW.



Potential water resources for electricity generation



Kilowatt

- 10 - 50
- 51 - 100
- 101 - 500
- 501 - 1000
- 1001 - 5000
- 5001 - 10000

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Source : KEBTKE Creation and Technology Innovation Book,
Indonesian Ministry of Technology and Mineral Resources

Potential water resources for electricity generation



Advantages of micro hydro electricity generation

- Environmentally friendly: does not produce greenhouse gas emissions and does not contribute to global warming.
- Cost effective: operational costs are lower than conventional power plants and their use does not require fossil fuels.
- Reliable, as it has the ability to operate with little maintenance. Reliable as a stable energy source → **suitable for development country**
- Reduce dependence on limited fossil energy and strengthen energy security → strong point
- Increase access to electricity in remote areas and can be operated in areas that are difficult to reach by the main electricity network.
- This can increase access to electricity in remote areas → East Indonesia

Advantage (con't)

- With great potential, Microhydro Power Plant has an important role in meeting electricity needs in Indonesia.
- It can be a potential alternative energy source to **reduce** dependence on fossils.
- The development of MHPP in Indonesia has been **quite rapid** in recent years.
- This is caused by the increasing need for electricity in Indonesia.
- Especially remote areas that are not yet reached by the main electricity network.

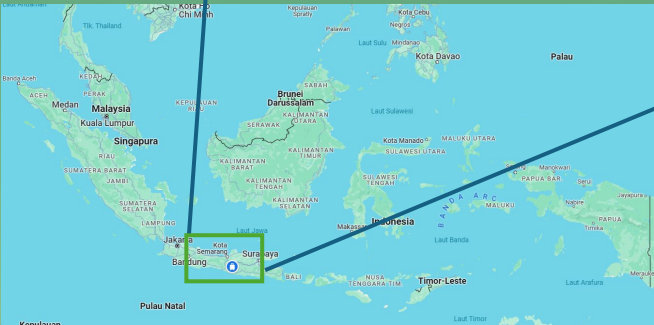
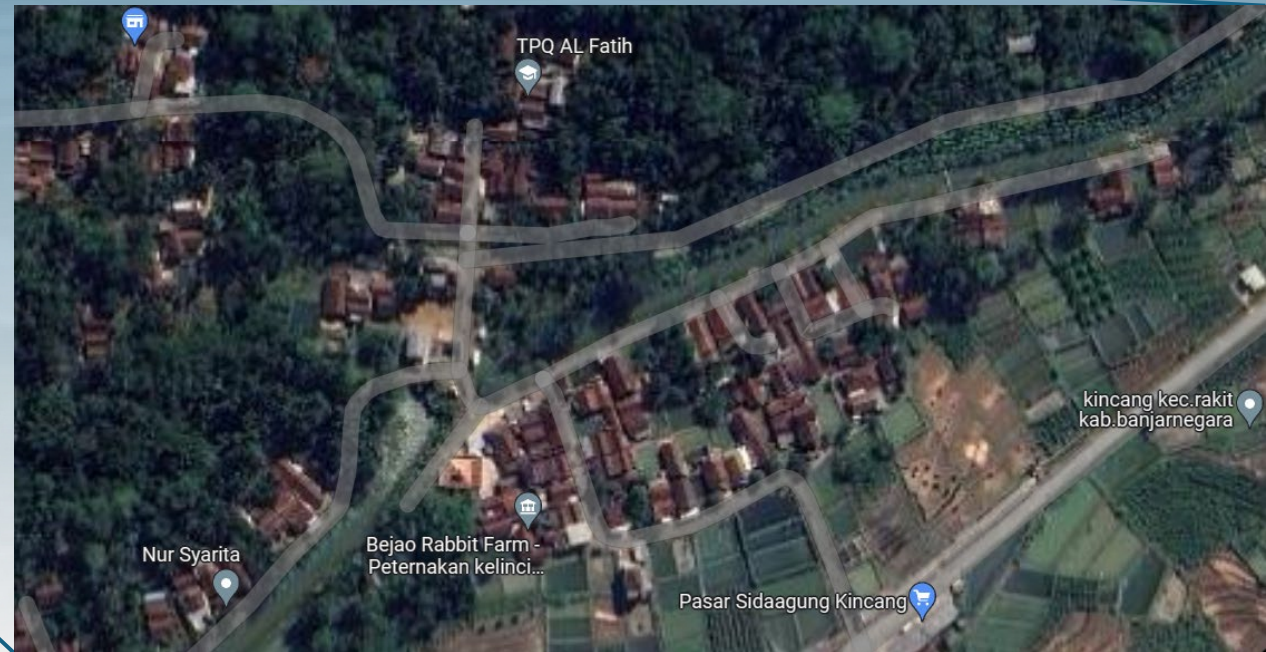
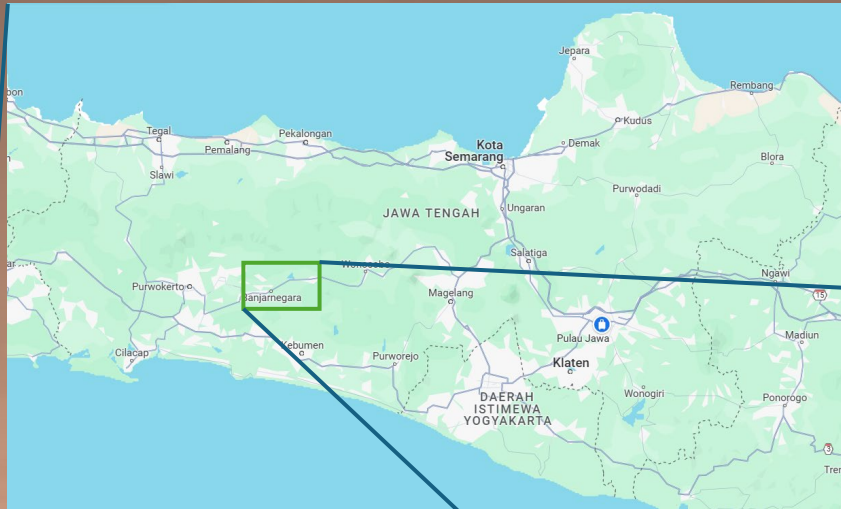
Disadvantage

- Building a Micro Hydro Power Plant (MHPP) requires large costs for a **micro business**
- During the **dry season**, the capacity of Micro Hydro Power Plants (MHPP) will decrease because the amount of water discharge usually decreases → **during April - October**
- The natural resources that will be utilized are usually located far from residential areas so that it requires long distances to distribute electricity to residential communities → East Indonesia

Case Study : Kincang micro hydro power plant



Banjarnegara, Central Java, Indonesia



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Brief of Kincang Power Plant

- The Kincang MHPP is built by utilizing water sources originating from the [Banjarcahyana Irrigation Channel](#).
- The government currently has a **very strong commitment** to developing new renewable energy potential,
- This is proven by the issuance of Minister of Energy and Mineral Resources Regulation No. 31 of 2009 which gave new enthusiasm to power plant developers, including hydropower developers.

Brief of Kincang Power Plant

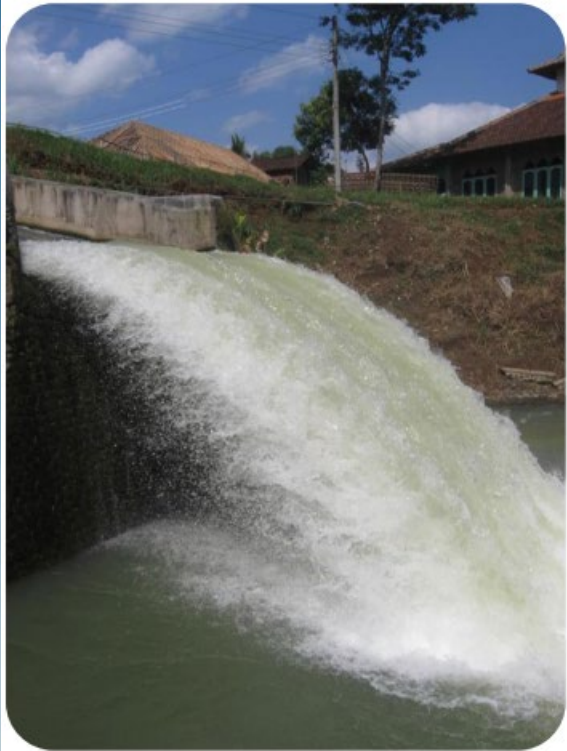
- This Ministerial Regulation provides certainty about the selling price of electricity to be purchased by PLN → USD0.05/kWh for the islands of Java and Bali
- Condition : without going through a **negotiation** and **price approval** process from the Minister of Energy and Mineral Resources.
- The electric power produced by MHPP Kincang is to be sold to PT.PLN (State Electric Company of Indonesia)

Kincang Microhydro Power Plant

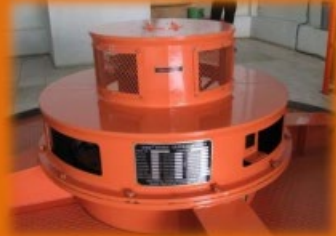


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PROYEK PLTMh KINCANG
KAPASITAS TERPASANG : 320 kW
LOKASI : DESA KINCANG, KECAMATAN RAKIT,
KABUPATEN BANJARNEGARA



PT. NALURI ENERGI UTAMA
 Independent Power Producer



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Design Criteria

Paramater	Discharge (m3/s)
Plan debit (65% probability)	8,35
Maximum discharge	8,35
Minimum discharge (40% maximum discharge)	3,34
Flood discharge (irrigation channel capacity)	12,0

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Discussion

- The operating micro hydro power plant has a small capacity, namely around 60 MW.
- MHPP is an alternative electricity generator that can save on fuel oil .
- The recent strengthening of crude oil prices has provided momentum to optimize other energy sources, especially renewable energy, such as Micro Hydro Power Plants (MHPP).
- Improvement :
 - Water control flow by electronically
 - Energy management
 - Internet based monitoring

Discussion

- According to data from the Ministry of Energy and Mineral Resources (ESDM), hydropower potential is spread throughout almost all of Indonesia
- Suitable for almost small river
- suitable for the capabilities of the wider community in terms of building feasibility
- Estimated to reach 75,000 MW
- While utilization is only around 6% of the existing potential.

Conclusion

- It is necessary to encourage the use of water energy to produce clean energy
- Micro-scale strengthening can be a priority to develop community participation
- The real participation that already exists is in the form of IPP (Independent Power Producer) initiated by the community
- There needs to be greater public attention and concern, so that water resources to produce electricity can be further improved
- MHPP Kincang can be a model for community groups who want to produce electricity and sell it to the state electricity company



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Thank You

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