Part 4 Master Plan of Potential Run-Of-River Hydropower Sites

Chapter 1 Preface

Based on the Scope of Works of the Feasibility study on Introduction and Development of Advanced Run-off-river Hydropower Stations in the Republic of Indonesia which was agreed and signed by the Director of Electric Power Planning, Directorate General of Electricity and Energy Development (DGEED), Ministry of Mines and Energy, and the Leader of Preparatory Study Team for the said study, Japan International Cooperation Agency (JICA), the study was commenced on July 18, 1997.

However, due to the economic crisis in Indonesia since August, 1997, possibility of realization of the run-off-river hydropower development along the Cilaki river has become questionable and M/M on the revision of S/W was signed by DGEED and JICA October 5, 1998.

Based on the above M/M, selection of potential run-off-river hydropower sites was added. This selection study is to find out potential run-off-river hydropower sites using the available existing topographic maps at 1:50,000 and hydrological information and to select promising sites.

Chapter 2 Selection of Objective Area

There are plenty of potential run-off-river hydropower sites in Indonesia. Among those, two areas were chosen as below which have been covered by existing topographic maps at 1:50,000 and to which hydrological information obtained from the past various studies can be applied.

2.1 West Jawa

Many rivers around the Cilaki river which was thought to be a model originate in a high land of 2,000 m in elevation at the south of Bandung and empty into the Indian Ocean in parallel to the Cilaki river. those rivers are short in length and steep longitudinally and therefore, it is expected that potential run-off-river hydropower site could be found.

2.2 South Sulawesi

There are many rivers in the north part of the south Sulawesi which originate in mountains of 2,600 m in height. Among those rivers, the biggest river is the Sadan river. there are several promising sites for hydropower development in the Sadan river system. Among them, Bakaru hydropower plant (126 MW) along the Mamasa river, tributary of the Sadan river, has been developed in 1992 and extension of another 126 MW is planned.

Although hydropower development schemes in the north part of the south Sulawesi is concentrated in the Sadan river system, it is expected that potential run-off-river hydropower site could be found along other medium/small rivers.

Chapter 3 Selection of Potential Development Sites

3.1 West Jawa

There is a mountain range with the length of 100 km in East-West direction and the height of 2,000 m to 2,800 m at the south side of the Bandung city, capital of the West Jawa Province, and more than 20 rivers are originated in the mountain range, flow toward south and empty into the Indian Ocean. the Cilaki river is one of those rivers and other rivers also flow from 2,000 m high to 0 m with short stretch and steep longitudinal slope.

Among those rivers, six rivers were chosen whose catchment area is deemed to be more than 50 km^2 and river slope is also deemed to fit run-off-river hydropower development. the locations of those rivers is shown in Fig. 3.1.1.

Followed by the above selection, longitudinal section of those rivers were drawn and section with the river slope of steeper than 1/100 and further the catchment area of larger than 50 km^2 was identified as the potential run-off-river hydropower development section.

The above identified section was marked on the topographic maps at 1:50,000 and topographically possible layout plans of hydropower facility were drawn up on the maps.

On the other hand, from the discharge duration curve and catchment area at the proposed intake site, maximum water discharge was determined.

Thus the installed capacity is found from the maximum discharge and available water head and annual energy generated is also found from the annual available water volume.

In addition, preliminary construction cost is estimated from main dimensions of facility in the preliminary layout plan.

The objective rivers studies are six (6) rivers as below and as shown in Fig.3.2-1.

Ci Buni
Ci Sadia
Ci Pandak
Ci Rompang
Ci Kandang

Ci Kaingan

Total 24 development schemes are drawn along the above six rivers and five schemes are selected as the five lowest unit construction cost. The results are as below;

Ci Buni	Two (2) sites	14.2 MW and 12.1 MW
Ci Kandang	Three (3) sites	8.9 MW, 5.9 MW and 5.0 MW

3.2 South Sulawesi

In the South Sulawesi, seven (7) rivers which are originated from Mt. Gandadiwata, Mt. Telondokaloudo and Mt. Kambuno were chosen as below, and development schemes of total thirty (30) sites were compared.

Salu Uro
Salu Hau
Salu Mander
Salu Maloso
Salu Rongkong
Salu Balease
Salu Palikala

Among the thirty sites, five (5) sites were selected as the five lowest unit construciton cost per kWh. The results are as below:

Salu Uro	Two (2) sites	181.0 MW and 178.7 MW
Salu Hau	Three (3) sites	48.2 MW, 36.0 MW and 18.9 MW

In addition to the aboves, another sixteen (16) sites along the other rivers except Salu Mander were found out as promising sites.

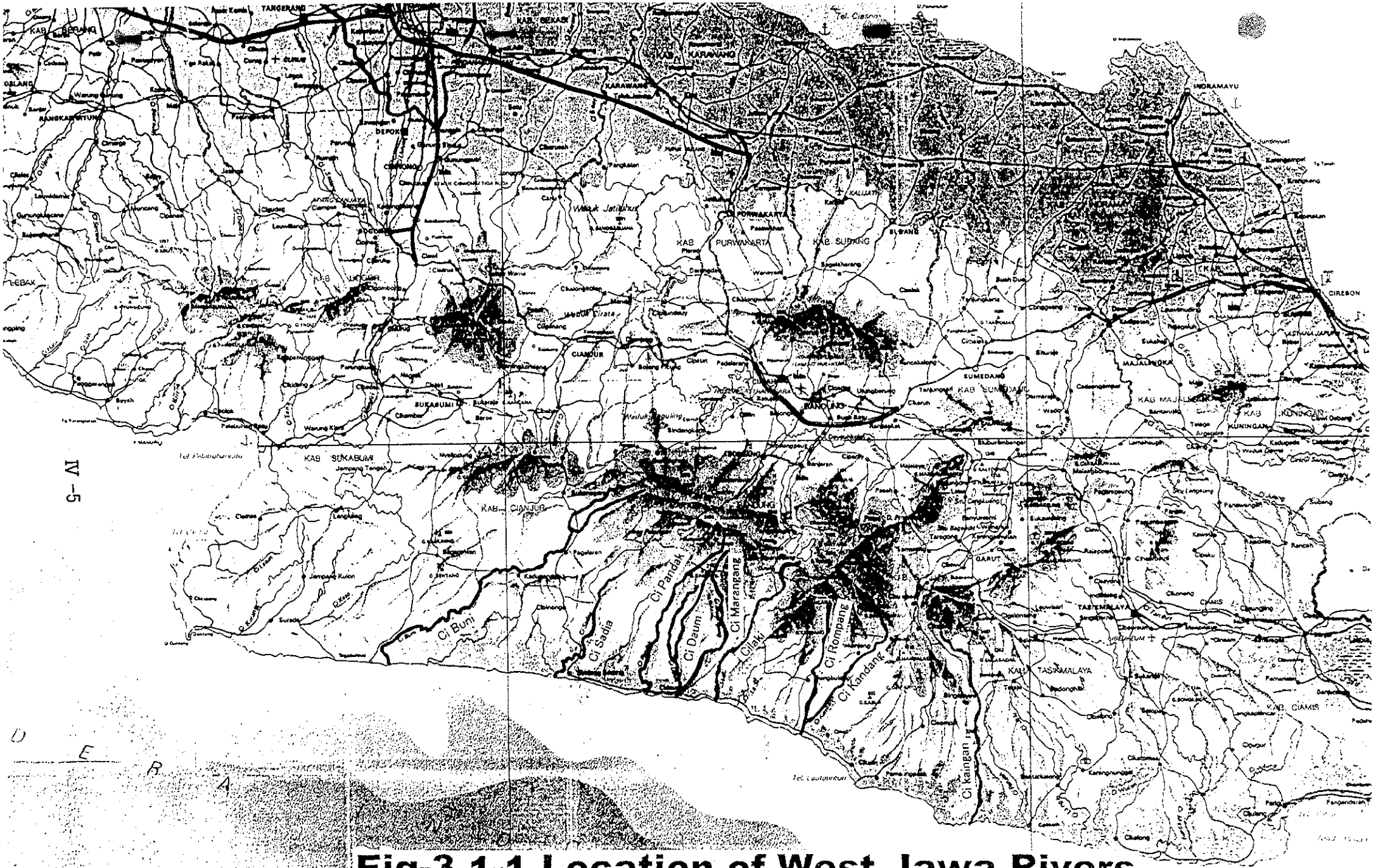

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Fig-3.1-1 Location of West Jawa Rivers

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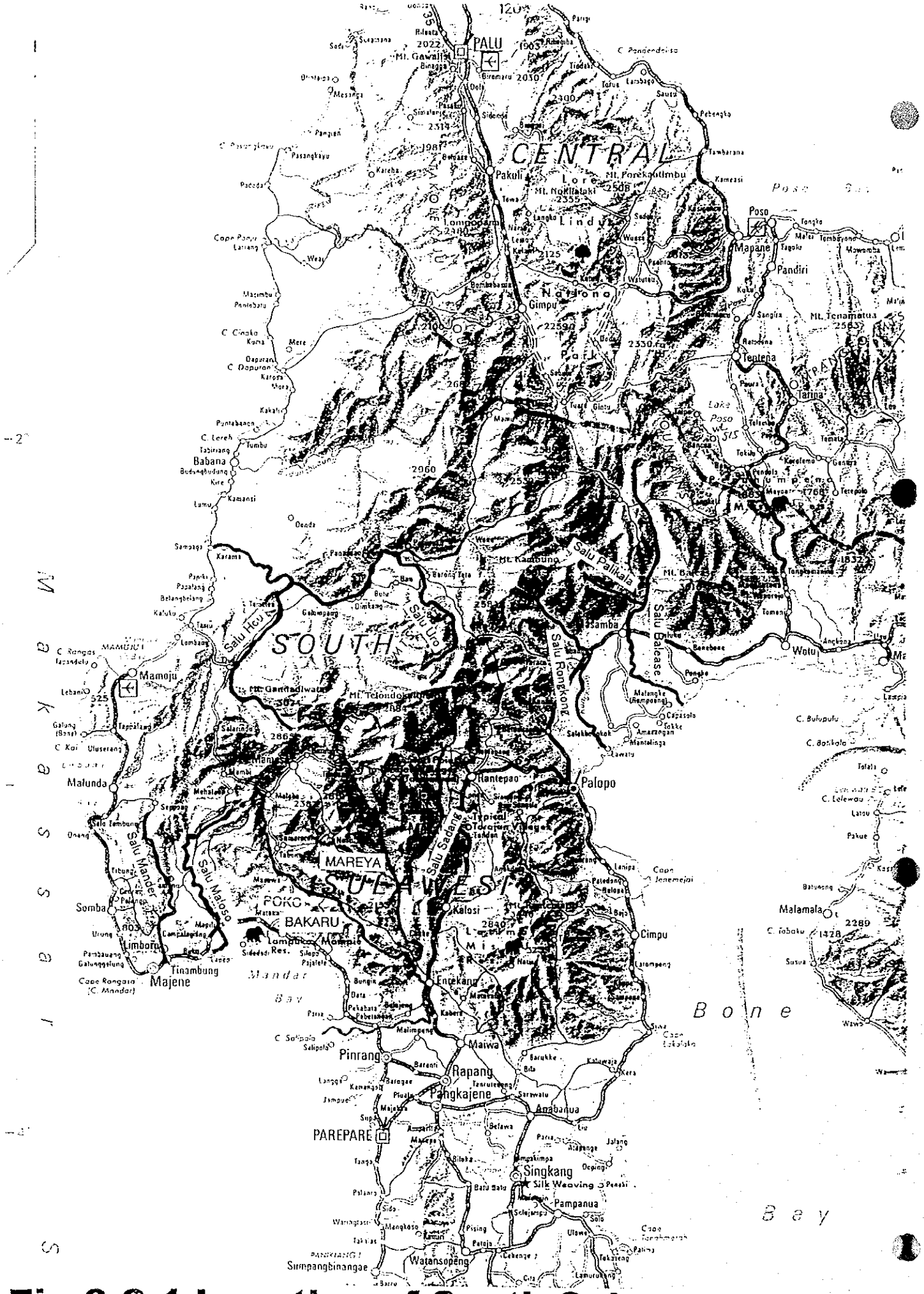

Fig-3.2-1 Location of South Sulawesi Rivers