Feasibility Study for Nuclear Desalination Plant Construction in Madura Island

Bambang Suprawoto

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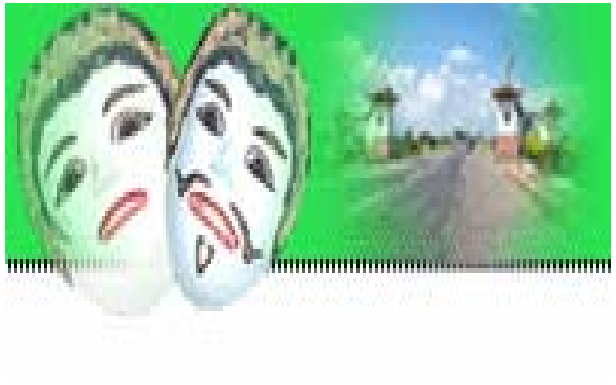

I. Introduction

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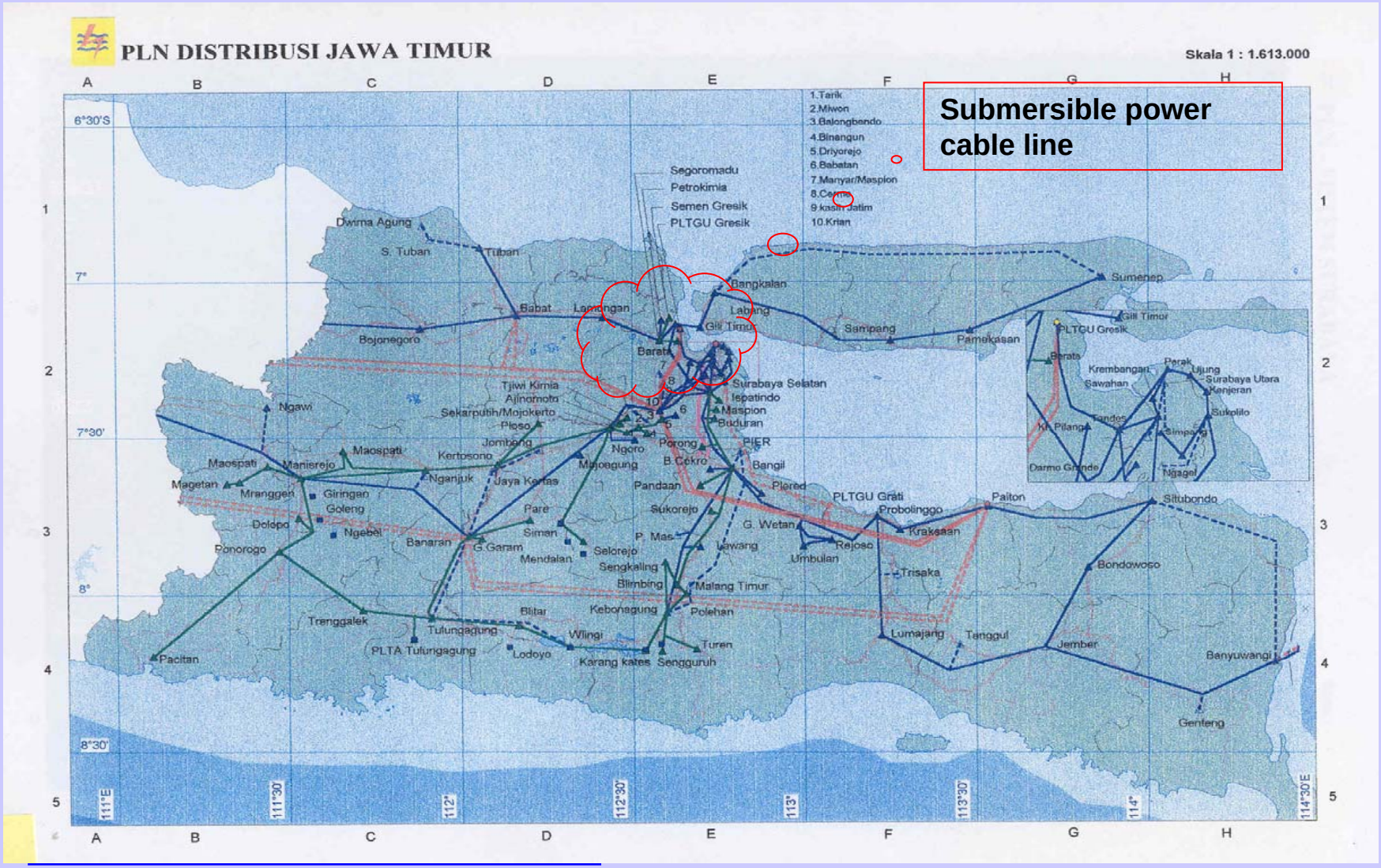
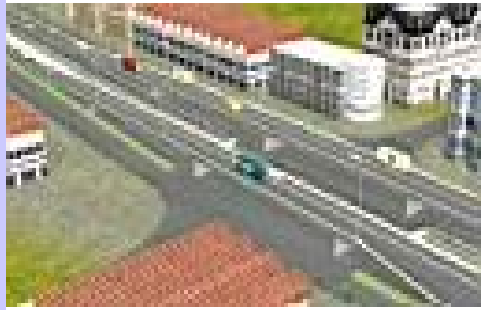
Dependency to the Java – Bali grid



Reasoning of the proposed Project

- Madura island is a potential area to be developed, however such limitation has to be solved:
  - **Dependency of the electrical power of the whole Madura island to the Java-Bali grid**
  - **Water scarcity and limited ground water resources (as per requirement for standard living and industrial used)**
- Madura island is a dominant salt producer for the whole Indonesian, however within the last 5 years salt production is decreasing
- The proposed project will offer a practical and realistic option to provide the Madurese with sufficient power and potable water for the public and to support industrialization and tourism in the Madura Region.



II. Study on Human Resources Development on Industrialization in Madura

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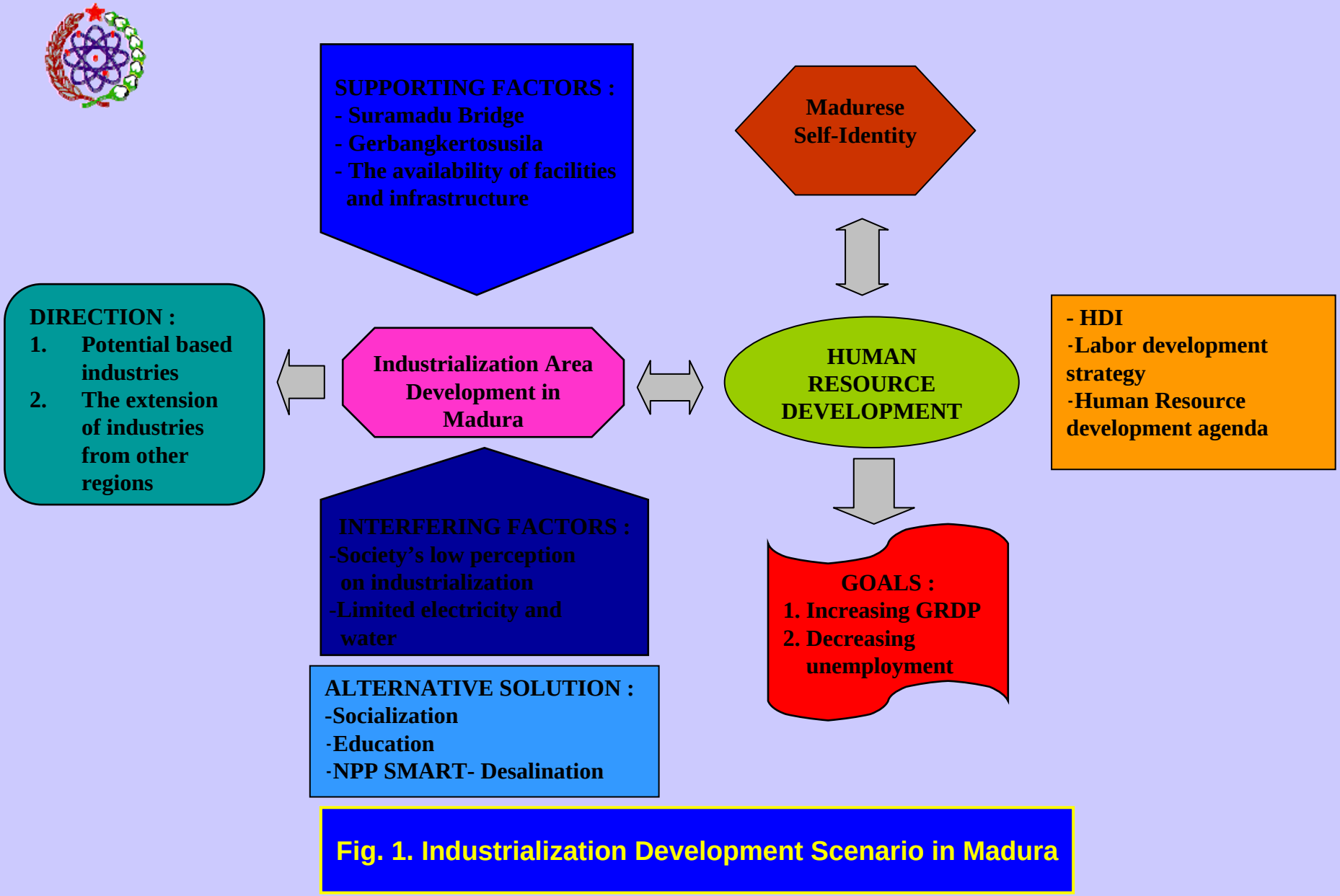

Fig. 1. Industrialization Development Scenario in Madura

Study on Human Resources Development on Industrialization in Madura

Table 1. Human Resources Based on HDI Analysis in Madura and Some Other Areas of East Java [1]

Regency	LEI	EI	PPI	HDI
Gresik	74,33	78,53	61,44	71,44
Mojokerto	74,83	76,58	61,51	70,98
Surabaya	73,88	85,35	53,35	70,86
Sidoarjo	74,17	85,09	56,93	72,06
Lamongan	74,05	70,66	56,15	66,95
Bangkalan	62,33	59,84	56,89	59,69
Sampang	55,92	48,87	57,18	53,86
Pamekasan	65,75	64,78	57,11	62,55
Sumenep	62,00	59,23	53,69	58,31
Averages MADURA	61,50	58,18	56,60	58,60
Averages (East Java)	70,33	70,92	52,21	64,49

III. The Projection of Water Supply and Demand up to year 2020 In Madura Island

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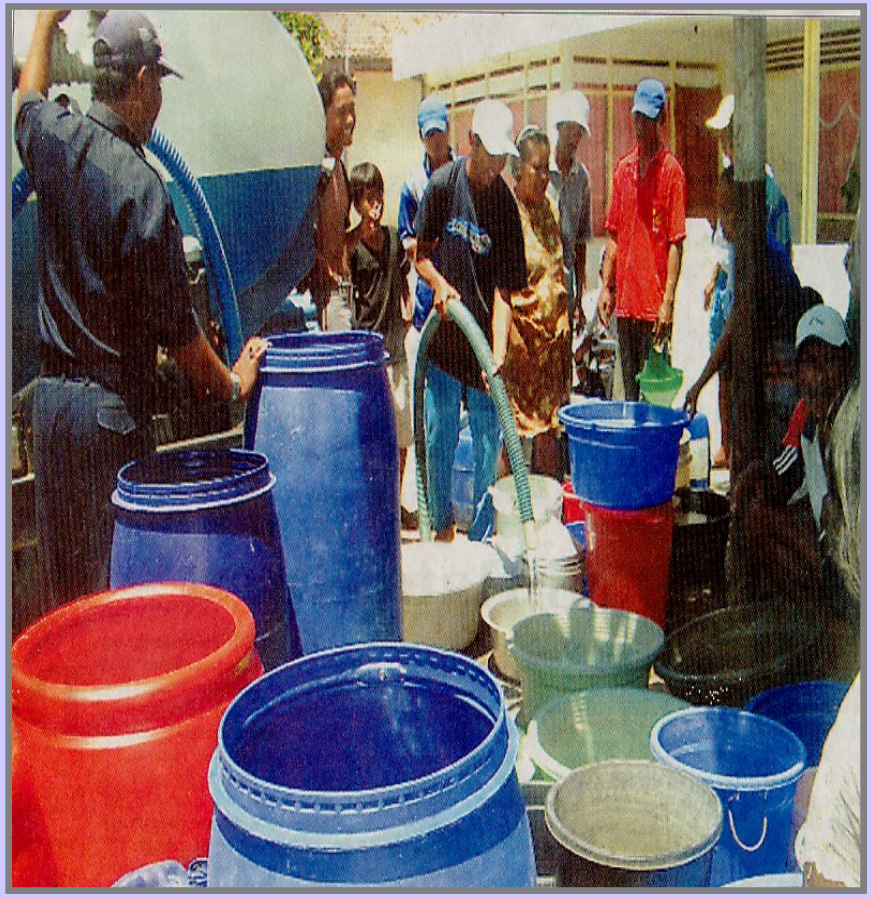
WATER CONDITION IN MADURA

- ☹ THE AMOUNT OF WATER IS LIMITED
- ☹ IN THE DRY SEASON PEOPLE HAVE DIFFICULTIES TO GET WATER
- ☹ NO INTEGRATED WATER DISTRIBUTION SYSTEM OVER MADURA ISLAND
- ☹ THE WATER DEMAND IS A SUPPRESSED ONE
- ☹ WATER DISTRIBUTION SYSTEM IS AVAILABLE IN THE SURROUNDING CITIES ONLY
- ☹ THE WATER QUANTITY DEMANDED TO BASE THE EXPANSION DEPENDS UPON THE SCENARIO INDUSTRIAL DEVELOPMENT



Water Demand, Supply & Deficit in 2004 up to 2020 (m3/day)

Explanation	2004	2010	2015	2020
Bangkalan				
Water Demand	62,611.87	66.438,37	71.278,36	76.467,65
Water Supp'd by PDAM	6,946.77	12.954,15	39.528	39.528,00
Water Supp'd by individual syst.	28,076.90	28.076,90	28.076,90	28.076,90
Water deficit	27,588.20	25.407,32	3.673,46	8.862,75
Sampang				
Water Demand	61,949.82	65.750,18	70.317,52	75.483,74
Water Supp'd by PDAM	6,213.58	13.393,44	27.540,00	27.540,00
Water Supp'd by individual syst.	28,114.91	28.114,91	28.114,91	28.114,91
Water deficit	27,621.33	24.241,83	14.662,61	19.828,83

Based on an assumption:

120 L/cap/day in the urban areas

60 L/person/day in the rural areas

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Water Demand, Supply & Deficit in 2004 up to 2020 (m3/day)

Explanation	2004	2010	2015	2020
Pamekasan				
Water Demand	57,246.26	60.784,92	65.263,07	70.029,05
Water Supp'd by PDAM	6,989.76	7.746,60	23.544,00	23.544,00
Water Supp'd by individual syst.	26,281.19	26.281,19	26.281,19	26.281,19
Water deficit	23,975.31	26.757,13	15.437,88	20.203,86
Sumenep				
Water Demand	75,958.96	80.606,93	86.556,20	92.838,57
Water Supp'd by PDAM	6,427.14	12.449,72	30.780,00	30.780,00
Water Supp'd by individual syst.	35,807.53	35.807,53	35.807,53	35,807.53
Water deficit	33,724.29	32.349,68	19.968,67	26.251,04
Total Deficit	112,909.13	108.755,96	53.742,62	75.196,48

Based on an assumption:

120 L/cap/day in the urban areas

60 L/person/day in the rural areas

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Proposed solution

- 2 x 100 MWe reactor would be fit to the comply with the power required in this island
- The desalination plant have been used in Indonesia since end of 1970's by power plant operated by PLN (state own electricity company), most of them used MSF/MED technology.
- To fulfill external demand of fresh water, capacity of the desalination plant should be increased.
- 4 x 10,000 m^3/day is used as a design basis of the desalination plant using SMART reactor, MED/MSF technology
- The brine water will be used as a feeding line of the salt production in the Madura Island.

Location of the proposed sites

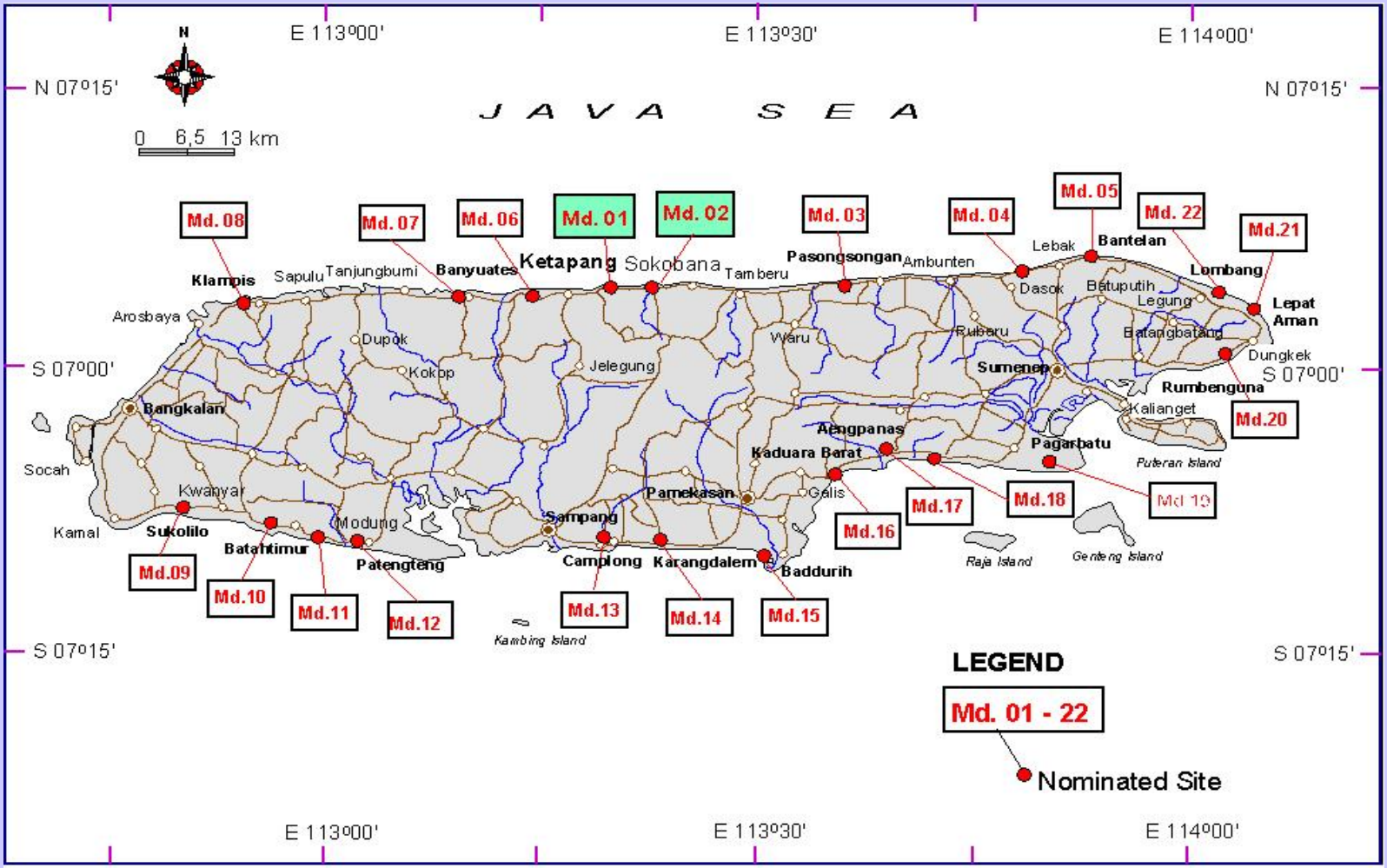

Figure 4.7. Location Map of Nominated Site

IV. Public Information & Education

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Public Information & Education

- **The proposed workshop is aimed to provide information and education to the public and concerned community groups, and share experience on nuclear desalination as well as to provide information on technical, safety and economic aspects and public awareness for decision makers.**
- **The results of the workshop are followings:**
  - **BATAN is recommended that it continue its activities on deepening the project preparation and the communication with the community, with maximum use of its accumulated experience and resources to coordinate developing further infrastructures needed for the nuclear desalination project in Madura. It is also recommended that BATAN consider transferring its accumulated expertise to its younger staff for long-term activities on relevant subjects, which are not limited to Madura.**
  - **It is recommendable to recruit more professionals (including PI communicators) from the region. That will work effectively in obtaining understanding of the religious (and academic) leaders, information penetration in the region, etc. PI communicators should be provided with training opportunities by external experience. If necessary, an external expert might be recruited as an assistant or a co-communicator for the personnel from the region.**
  - **BATAN is advised to disseminate fair and objective information including benefits to the local communities such as spin-off effects of industrial development and HRD.**
  - **PI is an activity to be continuously implemented by coordination with the central and local governments. BATAN should take note that most of PI methodologies are applicable to any other nuclear projects but specific contents and priorities of activities depend on specific projects.**

Public Information & Education

National Workshop on Public Information on Nuclear Desalination on Nov. 27- 29, 2005 in Pamekasan - Madura.

Public Information & Education

Workshop on Public Information & Education of Nuclear Desalination on Nov. 28- 29, 2006 in Sumenep - Madura.

Public Information & Education

RADAR MADURA

11 Maret 104

Penolakan PLTN di Madura Harga Mati

Walhi : Masih Banyak Teknologi Lain Yang Bisa Dikembangkan

BANGKALAN - Gelombang penolakan terhadap rencana pembangunan Pembangkit Listrik Tenaga Nuklir (PLTN) Madura terus mengalir. Pelaksana Harian Direktur Eksekutif Wahana Lingkungan Hidup (Walhi) Jatim Susilaningtias dengan tegas menolak rencana pembangunan PLTN tahun 2015. Menurut pemerhati lingkungan ini, penolakan PLTN menjadi keputusan yang tidak bisa ditawar lagi.

"Penolakan ini (PLTN, Red) sudah menjadi harga mati bagi kami (Walhi). Karena realitanya, masih banyak teknologi lain yang bisa dikembangkan di Indonesia. Tapi, kenapa pemerintah memilih nuklir?" tandas Susilaningtias ketika dikonfirmasi wartawan koran ini, kemarin.

Susilaningtias

Menurut Tias -panggilan akrab aktivis berjilbab ini- gerakan penolakan PLTN akan dilakukan bersama-sama masyarakat. Bahkan, Walhi Jatim menyiapkan gerakan menolak PLTN sebagai isu bersama di tingkat nasional. "Target kita, di Indonesia tidak ada PLTN," tukasnya.

Walhi juga mempertanyakan rencana pemerintah yang memilih nuklir untuk memenuhi kebutuhan listrik, ketimbang teknologi lain yang lebih ramah. Seperti PLTU (uap), PLTA (air), PLTG (gas), atau energi angin. Sebab, teknologi tersebut juga menghasilkan listrik dan sangat aman dikembangkan di Indonesia. ■

Baca Penolakan... Hal 31

Galang Kekuatan, Temui Para Bupati

■ PENOLAKAN

(sambungan dari halaman 29)

"Jangan-jangan, PLTN justru menjadikan kita (Indonesia) sebagai tempat sampah nuklir dari negara lain. Sebab, negara yang berinvestasi di Indonesia saja melarang pembangunan nuklir. Tapi kenapa dikembangkan?" sergah Tias.

Apakah PLTN proyek titipan negara lain? secara diplomatis direktur Walhi Jatim ini mengaku belum tahu. "Yang kami tahu, negara-negara maju dan negara yang berinvestasi disini melarang nuklir. Kalau proyek titipan, kami belum tahu," terang Tias.

Sementara itu, Aliansi Masyarakat Madura Pemerhati Nuklir (AM2PN) berencana bergerilya ke pimpinan eksekutif dan legislatif se Madura. pemerhati nuklir ini meminta para pemimpin di masing-masing kabupaten untuk menyatakan sikap terhadap rencana pembangunan PLTN Madura.

"Kita akan terus berusaha menggalang kekuatan dari semua lini. Mulai dari masyarakat, tokoh masyarakat, ulama, dan umaro. Rencananya, setelah dari NU, kita akan menemui bupati dan ketua DPRD se Madura," kata Korda AM2PN Sampang Tamsul SE. (tra)

RADAR SURABAYA

KORAN KOTA BESAR

6 Maret

Gus Dur Tolak PLTN

AM2PN Ngadu PBNU, DPR, Men LH, dan Menristek

BANGKALAN • Penolakan terhadap pembangunan Pembangkit Listrik Tenaga Nuklir (PLTN) tak hanya disuarakan rakyat Madura. Mantan Presiden KH Abdurrahman Wahid pun berkata lantang. Dengan tegas Gus Dur menolak pembangunan PLTN Madura dan Jepara.

"Sejak dulu saya sudah menolak PLTN. Itu (PLTN, Red) tidak baik bagi Madura," tandas Gus Dur seperti ditirukan Korda Pusat Aliansi Masyarakat Madura Peduli Nuklir (AM2PN) Mutmainah SH melalui telepon usai pertemuan di kantor PBNU Jakarta, kemarin.

Gus Dur

Menurut Mutmainah, pernyataan Gus Dur itu disampaikan ketika perwakilan AM2PN bertanya mengenai rencana pembangunan PLTN tahun 2015. Tanpa beban, mantan ketua PBNU itu langsung menyatakan penolakan. "Alhamdulillah. Gus Dur mendukung kita," kata Mutmainah.

Rombongan AM2PN berangkat ke Jakarta untuk menyuarakan penolakan terhadap rencana pembangunan PLTN Madura. Pada kesempatan sama, AM2PN bergabung dengan Masyarakat Anti Nuklir Indonesia (MANI) yang menyuarakan penolakan pembangunan PLTN Muria. Gerakan anti nuklir itu juga dikawal Walhi Jatim, Walhi Jateng, dan Eksekutif Nasional Walhi Jakarta.

Setelah menghadap Gus Dur di PBNU, kelompok penentang pembangunan PLTN itu mendatangi kantor Menteri Lingkungan Hidup (Men LH). Di sana, mereka ditemui Isa, Humas Kementrian LH. Ada pernyataan melegakan disampaikan pihak kementrian. Mereka menyatakan siap berperang dengan rencana pembangunan PLTN.

Tak puas sampai di situ, rombongan kembali bergerak untuk menggelar dialog bersama Komisi VIII DPR RI yang diwakili Tunggu Siraid. Dalam pertemuan tersebut, komisi VIII menyatakan siap mempertimbangkan kembali rencana pembangunan PLTN.

Selanjutnya, rombongan dari Jatim, Jateng, dan Jakarta itu mendatangi Menristek. Sayang, rombongan tidak bisa bertemu langsung dengan Menristek Hatta Rajasa. Namun, pihak kementrian untuk membicarakan kembali masalah PLTN tersebut.

"Kami ke Jakarta untuk memperjuangkan penolakan masyarakat Madura terhadap pembangunan PLTN. Alhamdulillah, banyak yang merespon positif gerakan kita," terang dosen Unijoyo ini. Ikut dalam rombongan ke Jakarta, Dasuki Rahmad (Korda GMNI) Jatim, Muhlis (LePham), Tamsul (Korda AM2PN Sampang), dan Toyib (perwakilan Korda AM2PN Bangkalan).

Sekadar diketahui, Pemerintah Indonesia dan Korea Selatan telah menandatangani *Memorandum of Understanding* (MoU) tanggal 10 Oktober 2001 lalu. Saat itu, kedua negara menandatangani kesepakatan senilai US$ 200 juta terkait pembangunan PLTN Madura tahun 2015. Kabarnya, BATAN telah menyosialisasikan hasil penelitiannya sejak bulan Juni hingga Oktober 2003 kepada ulama dan tokoh masyarakat diempat Kabupaten.

Hasilnya cukup mengejutkan, BATAN mengambil kesimpulan, masyarakat di Kabupaten Bangkalan dan Sampang tertarik pembangunan PLTN. Sedangkan masyarakat Pamekasan dan Sumenep menerima. Ketertarikan terhadap pembangkit listrik dan air bersih desalinasi itu tidak dijelaskan secara detail. Namun, pembangunan PLTN akan menghasilkan penyulingan air laut dengan tenaga nuklir yang bisa menghasilkan tenaga listrik, air bersih, dan garam.

Namun, rencana pembangunan PLTN Madura semakin gencar ditolak. Selain masyarakat Sampang yang menjadi lokasi fisik PLTN, gelombang penolakan dilakukan AM2PN bersama 19 elemen ma-

V. Conclusion

CONCLUSIONS

- The supporting factors in Madura's industrialization development scenario include the Suramadu bridge, the extension of Gerbang Kertasusila into Germa Kertasusila, and the availability of facility as well as its water and electricity supplies; whereas, other interfering factors are society's low perception on the importance of industrialization and the limited water and electricity supplies.
- The human resources development is still inappropriate (Life Expectancy Index = 61, 5; Educational Index = 58.18; Purchasing Power Parity Index = 56.22; Human Development Index = 58.60) and considered below the average of East Java (Life Expectancy Index= 70, 33; Educational Index = 70.92; Purchasing Power Parity Index = 52.21; Human Development Index = 64.49).
- The development agenda, in order to improve the quality of Madurese' education, should consider the following aspects such as 1) curriculum development for Madurese human resources, 2) management development, 3) facilities and human resources training.

CONCLUSIONS

- In 2004, potable water demand in Madura Islands is 257,766.91 m^3/day, meanwhile the potable water supplied by PDAM is 26,577.25 m^3/day and the potable water supplied by individual system is 118,270.53 m^3/day, it means there is potable water deficit about 112,909.13 m^3/day. In the future, potable water supply deficit will reduce to 75,196.48 m^3/day.
- BATAN is advised to disseminate fair and objective information including benefits to the local communities such as spin-off effects of industrial development and HRD.
- PI is an activity to be continuously implemented by coordination with the central and local governments. BATAN should take note that most of PI methodologies are applicable to any other nuclear projects but specific contents and priorities of activities depend on specific projects.

Thanks for your attention

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