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SOURCE Shui-li K'an-ts'e (Survey of Water Power), published by the Information Bureau, Executive Yuan, Jun 1948.

ROUGH SURVEY OF THE POSSIBILITIES FOR HYDROELECTRIC POWER DEVELOPMENT IN CHINA

The following data is arranged in categories designated by the letters A to L below.

A: Name of river
B: Location
C: River of which it is a branch
D: Tributaries, forks and branches which make up the river.
E: Dates of surveys
F: Area of watershed
G: Length of river -- full length, or between points mentioned
H: Drop in elevation between points mentioned
I: Number, names, and location of sites considered suitable for dams and/or power stations
J: Effective pressure head, natural or potential
K: Aggregated potential amount of electric power that can be produced
L: Remarks

I. THE HUANG HO (YELLOW RIVER) AND ITS TRIBUTARIES

1. Huang Ho, Section 1

A: Section between Yung-ching [35 50, 103 00] and Ching-yuan [36 35, 104 30]
B: Kansu and Ningsia
E: 1940, 1942, 1946, and 1947

1940 Survey
I: 2 sites -- (1) Chu-la-ma-hsia, a 15-km gorge 50 km above Lan-chou [36 00, 103 11]; and (2) Liu-chia-hsia, a 5-km gorge 30 km above Chu-la-ma-hsia

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K: 9,000 kw at these gorges. If a 130-meter-high dam were built here, the aggregate potential would be 560,000 kw.

1942 Survey
I: Chu-la-ma-hsia
G: 200 km
H: 260 meters
K: With a high dam, one million kilowatts

1946 Survey
I: Chu-la-ma-hsia
J: 8-meter dam
K: 16,800 kw

1947 Surveys (consulting engineer, J. L. Savage of the US Reclamation Service)
(1) Chu-la-ma-hsia
I: Lower end
J: A high dam
K: 1,600,000 kw
(2) Sang-yuan-hsia, 20 km below Lan-chou
G: Length of gorge, 6 km
I: Lu-pam-yai, 1 km for lower end of gorge; good dam site
J: 17 meters
K: 30,000 kw

2. Huang Ho, Section 2. [This has already been covered in a previous FDB publication.]

3. A: Ta-hsia Ho
B: In Kansu; flows past Hsia-ho [35 25, 102,23] to Yung-ching [35 50, 103 00]
C: Huang Ho
E: 1942, 1946
G: 120 km to Yung-ching
I: 5 sites -- San-so-ma, Ch'[illegible]ou T'[illegible], Pei-yuan, Hu-li-hsia
K: 28,000 kw

4. A: T'ao Ho; Kao-lung-hsia
B: River source in the Hsi-ch'ing Shan in Tsinghai; [gorge is near 35 55, 103 15]
C: Huang Ho; confluence 80 km above Lan-chou
E: 1940
G: 20 km
H: 90 meters
K: 100,000 kw
L: The tail water at this point is sluggish; it would be more economical to build a high dam below Liu-chia-hsia and utilize the water of both streams

5. A: T'ao Ho; Cho-ni [34 38, 103 15] to T'ao-sha [35 40, 103 45]
E: 1942
G: 300 km
I: 2 sites -- Yeh-ku-ch'iao and Chiu-tsun-hsia
K: 35,000 kw

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6. A: Ta-t'ung Ho; Hsiang-t'ang-hsia [36 20, 103 00]
C: Huang-shui
E: 1940, 1943
F: Volume of flow is large
G: Gorge is 7 km long northward from its confluence with Huang-shui
H: Gorge is deep
I: Surrounding rock layers are of gneiss, affording a good base for a dam
J: Recommended 70-meter-high dam
K: 40,000 kw

7. A: Ta-t'ung Ho; Lien-ch'eng-hsia [36 35, 103 00]
B: Above Lien-ch'eng-hsia [36 35, 103 00] in Jung-tang Hsien, 40 km from the confluence of the Ta-t'ung Ho and the Huang-shui
E: 1943
G: 50 km
I: High dam at or near Lien-ch'eng
L: Local rock is granite

8. A: Huang-shui; upper reaches
B: Above Hsi-ning (Sining) [36 37, 101 49]
C: Huang Ho
D: Pei-ch'uan (north fork) and Nan-ch'uan (south fork) join the Huang-shui at Hsi-ning
E: 1940, 1942
I: (1) Ch'ao-yang-ts'un, just below Hsi-ning; (2) Upper Ch'ao-yang-ts'un, above Hsi-ning on the north fork
K: (1) 3,000 kw; (2) 400 kw

9. A: Shui-mo-kou
B: Short distance above Lan-chou [36 03, 103, 41]
C: Huang Ho
E: 1943
G: 19 km between Ho-kan-chen and Lan-chou
H: 400 meters
K: 200 kw for use in Lan-chou

10. A: Tsu-li Ho
C: Joins Huang Ho short distance west of Ching-yuan [36 37, 104 32]
E: 1942
L: Rainfall and consequent volume of flow so small as to give little hope of development

11. A: Wei Ho; the section above T'ien-shui, and its branches
B: Above T'ien-shui [34 36, 105 28] Kansu Province
C: Huang Ho
D: Lu-lu Ho and Chieh-shui
E: 1942, 1945, and 1947
F: 23,000 sq km
G: 90 km for Tu-su-chen to Kan-ku-ch'eng
H: 192 meters
I: 4 sites -- hsia-k'ou-ch'uan, Nan-ho-ch'uan, Lei-chia-p'ing, Hou-ch'uan-li
K: 6,800 kw

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1945 Survey
L: Nan-ho-ch'uan
K: 3,000 kw

1947 Survey
(1) Hu-lu Ho
G: 32 km Ch'in-an to confluence
H: 83 meters'
I: Hou-ch'uan-li
K: 2,000 kw
(2) Chieh-shui
G: 42 km from Wu-shih-li-p'u to its confluence
H: 236 meters
K: Several hundred kilowatts, with a low dam and a leading channel

12. A: Wei Ho; (1) Pao-chi-hsia, and (2) Shih-men-hsia
B: Above Pao-chi /34 16, 106 58/; (2) is upstream from (1)
E: 1945
G: 150 km
H: 450 meters

1945 Survey
I: A high dam near lower end of Pao-chi-hsia
J: 100 meters
K: 100,000 kw
L: Besides generating electric power, a dam impounding the water of the upper Wei-Ho would tend to retain much silt, diminish the danger of floods, and facilitate irrigation of tillable land in downstream areas. However, to do so would submerge much of the Pao-chi to T'ien-shui section of the Lung-hai Railway or necessitate a relocation of the railway line. Therefore, present intentions are to erect a low dam, to avoid submergence of the railway tracks, generating but 10,000 kw.

13. A: Ch'in-shui and Ta-t'ai-yen Ho
B: Pao-chi Hsien
C: Both small tributaries of the Wei Ho
E: 1941
I: Build a small dam on both streams
K: 100-200 kw on each stream
L: Also have large irrigation potentialities

14. A: Hei-shui Ho
B: Takes run-off from T'ai-pai Shan, south of Mei-hsien /34 11, 107 40/
C: Wei Ho
E: 1947
F: 1,300 sq km
G: 150 km
I: A high dam at Ai-kao-p'ing
K: 10,000 kw

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II. THE CH'ANG CHIANG (YANGTZE RIVER) AND ITS TRIBUTARIES

1. A: Ch'ang Chiang, San-hsia Section. Section 1
   B: Ch'ung-ch'ing [29 34, 106 35] to I-ch'ang [30 42, 111 17]
   E: 1933, 1945
   G: 650 km from Ch'ung-ch'ing to I-ch'ang; 200 km from Feng-chieh (K'uei-chou) [31 02, 109 31] to I-ch'ang. This stretch of the Ch'ang Chiang is famous for the "Yangtze Gorges"; the main sections of the gorges are: Ch'u-t'ang-hsia, Wu-hsia, Ping-shu-pao-chien-hsia, Niu-kan-ma-fei-hsia, and I-ch'ang-hsia; their combined length is 94 km where the river passes between 1,000-foot-high cliffs.
   H: 120 meters (between Ch'ung-ch'ing and I-ch'ang)
   I: 2 sites -- Ko-chou-pa and Huang-ling-miao
   K: 320,000 kw

   1945 Survey (consulting engineer, J. L. Savage, US Reclamation Service)
   I: Good site at Shih-pei for a 200-meter-high dam
   K: 10,560,000 kw
   L: This development would improve water transportation both above and below the dam, provide irrigation for downstream lands, and help to prevent floods. In 1946, an agreement was reached with the US Reclamation Service to proceed with the study of plans for development. In 1947, some drillings were made at the dam site, but because of lack of finances the work has been stopped.

2. A: Ch'ang Chiang, Chin-sha Chiang Section, Section 2
   (1) Chin-chiang-chieh [26 15, 100 34] to I-pin [28 46, 104 34]
   E: 1940
   H: 1,000 meters
   K: 10 million kw dependably
   (2) Between Yu-tung-t'an in Ch'iao-chia Hsien [26 55, 102 54] and Lao-chun-t'an
   H: 26 meters
   K: 20,000 kw, with a low dam and a tunnel

3. A: T'ang-lang Ch'uan
   B: This stream is the outlet of Tien-ch'ih (K'un-yang Hu of K'un-ming) [25 04, 102 41]
   C: Ch'ang Chiang
   F: 5,000 sq km
   G: 93 km from lake to Fu-min [25 14, 102 30]
   H: 200 meters
   I: 3 sites -- Shih-lung-pa, An-ning, and Fu-min
   K: 750,000 kw

4. A: P'u-tu Ho (section of T'ang-lang Ch'uan below Fu-min)
   B: From Fu-min to its confluence just above Mao-lu [26 19, 102 49]
   C: Ch'ang Chiang
   D: T'ang-lang Ch'uan, Chang-chiu Ho, Hsi-ma Ho
   E: 1938
   F: 10,000 sq km
   G: 200 km
   H: 730 meters
   I: 6 sites -- Hsiao-lung-t'an, I-ko, Hsiao-liu-k'u, T'ieh-so-ch'iao, Ta-miao, and Lu-ch'ang
   K: 140,000 kw

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5. A: Heng Chiang
B: Rises in northern Yunnan and western Kweichow Provinces
C: Ch'ang Chiang; confluence near I-pin [28 46, 104 34]
D: (1) Sa-yu Ho and its tributary, the Ta-kuan Ho (2); (3) Lo-tse Ho; (4) Pai-shui Chiang
E: 1941; 1943

(1) Sa-yu Ho
F: 4,900 sq km
G: Within 50 km downstream from Kao-ch'iao is a series of rapids and cataracts where the drop in elevation is 1,235 meters; these should be developed in 5 stages, and the aggregate potential will be 150,000 kw. Chief stage is in the Pai-shui-yen section, where the length is 6.5 km and the drop in elevation is 552 meters.
I: 1 site at Ta-ch'i-lao [27 33, 103 38] for a dam to regulate flow; then the aggregate potential will be 60,000 kw.

(2) Ta-kuan Ho
F: Source is a spring; flow is steady
G: 25 km to its confluence
H: 775 meters
I: Develop in 4 stages
K: 20,000 kw

(3) Lo-tse Ho
C: Heng Chiang
F: 3,780 sq km; flow is considerable
G: 22 km Ko-la-ho to Yen-wang-ch'iao
H: 520 meters
I: 2 good sites -- at Lao-li-kou and Ma-shan-tan

6. A: Chu-lo Ho
B: In Lu-tien, Chao-t'ung area [27 20,103 39]
C: Sa-yu Ho
E: 1943
F: 1,730 sq km
G: 64 km from San-chia-ts'un to confluence
H: 290 meters
I: 2 sites -- at Pien-yen, a 45-meter dam and reservoir to store 100 million cu m water; and at Ta-ko-chang a 35-meter dam to store 80 million cu m. The pupose of these is to regulate flow into Sa-yu Ho where the power is to be generated.

7. A: Niu-lan Chiang
B: Rises in Kao-ming Hsien, Yang-liu Hu, Yunnan Province
C: Ch'ang Chiang; confluence near T'ai-p'ing-ch'ang in Ch'iao-chia Hsien [26 55, 102 54]
E: 1941
G: 20 km, Chiang-ti to Pai-miao-wu
H: 120 meters
I: 2 sites for dams -- Tou-t'an-k'ou and Hsiao-yen-t'ou
K: 20,000 kw

8. A: Yin-min-ta-shui-kou (the Yin-min great watercourse)
B: In Hui-tse hsien, Yunnan; rises 3,000 meters above sea level
C: Ch'ang Chiang [confluence near 26 19, 102 54]
E: 1942
G: 8 km, Yin-min to its confluence

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G: 8 km
H: 1,700 meters
I: If a 6-km-long pipe line is constructed, effective pressure head will be 1,500 meters.
K: 20,000 kw
L: This development would be near the area of China's most important copper mines.

9. A: An-ning Ho; upper reaches
B: In Sikang Province; rises in Hsiao-hsiang Ling and flows past Hsi-ch'ang [27 53, 102 18]
C: Ya-lung Chiang; Ch'ang Chiang
D: Hai Ho
E: 1940
I: 4 sites -- P'ing-pa, Hsia-k'ou-shan, Hsin-ch'iao-shan, and Sun-shui-kuan
K: 30,650 kw

10. A: Hai Ho and its tributaries
B: Hsi-ch'ang [27 53, 102 18] Sikang Province
C: An-ning Ho
D: Ang Hai, Tung Ho, Hsi Ho
E: 1941
F: Tung Ho, 550 sq km; Hsi Ho, 135 sq km
G: 15 km
I: 4 points for development on the Tung Ho and Hai Ho
K: 10,000 kw

11. A: Ch'ing-fu Ho
B: Rises in the Ta-hush Shan on the border of Szechwan and Yunnan; flows past Ch'ing-fu [28 27, 104 30]
C: Ch'ang Chiang; confluence 20 km below I-pin [28 46, 104 34]
E: 1941
F: 4,500 sq km
G: 200 km
I: Rapids at three places where power could be developed -- Nan-kuang-t'an, Tsu-t'an, Mu-t'an
K: 15,000 kw

12. A: Min Chiang; section from Hsing-wen-p'ing to Kuan-hsien
B: Northwest of Ch'eng-tu, Szechwan
C: Ch'ang Chiang; confluence at I-pin [28 46, 104 34]
E: 1935, 1944, and 1946

1935 Survey
G: 47 km Hsuan-k'ou to Kuan-hsien [31 00, 103 37]
I: 3 sites -- Yu-ch'i-k'ou, Shang-t'ai-tzu, Tu-chiang-yen
K: 126,400 hp

1944 Survey (consulting engineer, J. L. Savage, US Reclamation Service)
H: Between Ma-ch'i and Kuan-hsien descent of river is rapid and volume of water is great.
I: 2 sites -- Ma-ch'i, and at Yu-tsui, a point in Tu-chiang-yen
K: 820,000 kw

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1946 Survey (consulting engineer, a Canadian)
B: Kuan-hsien to Pai-hua-t'an
G: 35 km
H: 2 sites
(1) Recommended construction of a tunnel from a point between Pai-hua-t'an and Ma-ch'i to a point between Hou-tzu-p'o and Tzu-p'ing-p'u; aggregate potential, 150,000-200,000 kw.
(2) Recommended construction of a low dam and a leading channel at Yu-tsui of Tu-chiang-yen; aggregate potential, 15,000 kw.
L: Inspections indicate the best points for dams are at Tzu-p'ing-p'u and Hsuan-k'ou. In the first stage, 30,000 kw and 40,000 kw respectively; ultimately, aggregate potential about 80,000 kw.

13. A: Ch'ing-i Chiang; section below Ya-an [30 00, 103 02]
B: Sikang and Szechwan Provinces
C: Min Chiang; confluence near I-pin [28 46, 104 34]
E: 1935
F: 11,000 sq km
G: (1) 170 km, Ya-an to confluence; (2) 50 km, Ya-an to Hung-ya (drop in elevation of 120 meters)
I: 2 sites -- Kao-tien-tzu and Chu-ch'ing-pa
K: 26,000 hp

14. A: Ch'ing-i Chiang; section above Ya-an [30 00, 103 02]
B: Sikang Province, To-kung-hsia, between Fei-hsien-kuan and Hsi-ch'ang [sic; it appears that Hsi-ch'ang has been erroneously printed instead of Ya-an]
C: Min Chiang
E: 1940
I: The channel through this gorge of hard red sandstone is only 20 meters wide. Recommended construction of a 25-meter-high dam in this To-kung Hsia
K: 17,000 kw

15. A: (1) Ta-tu Ho and (2) Ma-pien Ho
B: Sikang and Szechwan Provinces
C: Min Chiang; confluence (1) near Lo-shan [29 34, 103 45] and (2) south of Chien- wei [29 10, 103 52]
E: 1935, 1940
F: 60,600 sq km

(1) Ta-tu Ho
G: 200 km from Fu-lin-chen [29 21, 102 43] to the sandy bend at Lo-shan
H: 600 meters
I: If a 7-km-long tunnel were cut from a point above T'ung-chieh-tzu on Ta-tu Ho to Huang-tan on Ma-pien Ho, then an 80-meter pressure head could be obtained

(2) Ma-pien Ho
G: 35 km from Yu-tzu-k'ung to Ch'ing-shui-ch'i
H: 50 meters
I: A dam should be built at Ch'ing-shui-ch'i [29 07, 103 51] on the Ma-pien Ho so as to again use the water brought over by the tunnel from the Ta-tu Ho.
K: 1,700,000 kw

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16. A: T'o Chiang, small branches
B: Szechwan, area above Nei-chiang [29 35, 105 03]
C: Ch'ang Chiang
D: Hsiao-ch'ing-liu, Hsiao Ho, Shih-ch'i Ho
I: On Hsiao-ch'ing-liu at Tou-k'ou; on Hsiao Ho at Hui-lung-kuan
K: Several tens of kilowatts

17. A: Yen-ching Ho, Yung-ch'i Ho, Wei-yuan Ho
B: Fu-shun Hsien and Pai-jung Hsien, Szechwan
C: T'o Chiang
I: 2 points
K: Not more than 300 kw

18. A: Hu-shui
B: Ta-tsu Hsien, Jung-ch'ang Hsien and Lu Hsien, Szechwan
C: T'o Chiang
F: 2,900 sq km
G: 150 km from Nan-men in Ta-tsu Hsien to its confluence
H: 130 meters
I: 3 sites -- at Yu-chien-yen-tung, Tou-tung, and Ch'i-t'ou
K: 5,000 kw

19. A: Chia-ling Chiang; upper section
B: Ch'ao-tien-i [32 40, 105 52] to Kuang-yuan [32 26, 105 52]
C: Ch'ang Chiang
E: 1942
G: 3[illegible] li [1 li = 1/3 mile]
I: Ch'ing-feng-hsia, and Ming-yueh-hsia. Gorges only 100 meters wide; in limestone rock
L: Besides power, the water backed up by the dams would greatly facilitate water traffic

20. A: Kao-k'eng-ch'i
B: Pa Hsien, Szechwan
C: Chia-ling Chiang
F: 570 sq km
H: Famous for its waterfall
I: 2 sites
K: 1,000 kw

21. A: (1) Fou Chiang; (2) Liu-lin-t'an
B: 5 km northwest of San-t'ai [32 40, 105 52]
C: Chia-ling Chiang
H: The natural rapids of Liu-lin-t'an are 5 meters high; volume of flow is large
I: Construct dam at upper end of Liu-lin-t'an rapids, and conduct water in a channel to powerhouse at lower end
K: 2,000 kw

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22. A: Hsiao-an-ch'i
B: Jung-ch'uan Hsien, T'ung-liang Hsien, Ho-ch'uan Hsien, Szechwan
C: Fou Chiang
E: 1941
F: 1,600 sq km
G: 150 km
H: 90 meters
I: Kao-k'eng
K: 2,000 kw

23. A: (1) Lung-tung-ch'i, (2) Hua-t'an-ch'i, (3) Pai-ta Ho, (4) Hsi-ch'i Ho, (5) Hsi Ho, (6) Ch'u Ho, (7) Lung-wang Ho
B: Eastern Szechwan; (1) and (2) in Pa Hsien; (3) and (4) in Yueh-ch'ih Hsien; (5), (6) and (7) in Nan-ch'ung Hsien

C: All eventually flow into the Ch'ang Chiang
E: 1941; 1942
K: (1) several tens of kw; (2) 200 kw

24. A: Ta-hung Ho
B: Lin-shui Hsien and Ch'ang-shou Hsien, in Szechwan
C: Ch'ang Chiang, left bank
E: 1940
F: 3,700 sq km
G: 90 km between Mao-kou-t'an and Ta-hung-kang
H: 130 meters
I: 2 sites -- Huang-yen and P'ai-hua-tung
K: 26,000 kw

25. A: (1) Lung-ch'i Ho; (2) T'ao-hua-ch'i
B: Ch'ang-shou Hsien, Szechwan
C: Ch'ang Chiang, left bank; confluence near Ch'ang-shou [29 51, 107 03]
E: 1935

(1) Lung-ch'i Ho
H: 170 meters
I: 4 sites -- Shih-tzu-t'an, Shang-ch'ing-yuan-t'ung, Hui-lung-chai, and Hsia-ch'ing-yuan-t'ung. Dam and reservoir at Shih-tzu-t'an
K: 64,000 kw

(2) T'ao-hua-ch'i
I: 2 sites -- T'ou-t'ung and Er-t'ung; also at San-t'ung
K: 2,000 kw

26. A: Jang-tu-Ho
B: Wan-Hsien, Szechwan [30 49, 108 24]
C: Ch'ang Chiang, left bank
E: 1939
F: 240 sq km
G: 50 km
I: 4 sites -- Kao-t'ung, Lung-t'ung, Hsien-mu-t'ung, and Ch'ing-yu-k'ou
K: 3,300 kw

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27. A: Wu Chiang; lower section
B: Kweichow and Szechwan Provinces
C: Ch'ang Chiang, right bank; confluence at Fou-ling [29 40, 107 25]
D: In Szechwan Province; this river known as the Ch'ien Chiang (the Kweichow River); other tributaries, T'ang-yen Ho and Hung-tu Ho
E: 1942
F: Volume of flow is very large
G: 190 km, Lung-t'an to Fou-ling
H: 100 meters
I: Lung-t'an and Yang-chiao-chi
K: 710,000 kw

28. A: (1) T'ang-yen Ho; (2) Hung-tu Ho

(1) T'ang-yen Ho
B: Li-ch'uan Hsien, Hupeh Province
C: Wu Chiang
F: 6,000 sq km
G: 260 km

(2) Hung-tu Ho
B: Feng-kang Hsien, Kweichow Province
C: Wu Chiang
F: 3,000 sq km
G: 140 km

1942 Survey
(1) T'ang-yen Ho
H: 35-meter drop in 15 km, Chu-tzu-yen to confluence
(2) Hung-tu Ho
H: 20-meter drop in 27 km, Chiu-chi-tzu to Hung-tu-chen
K: 20,000 kw (1 and 2)

29. A: Tao-t'ien Ho
B: Hsiang-shui-t'an rapids, 1 km from Pi-chieh-ch'eng [27 18, 105 14] in Kweichow Province
C: Liu-ch'ung Ho, Wu Chiang
E: 1943
I: Small-scale development at Hsiang-shui-t'an
K: 300 kw

30. A: Mao-t'iao Ho
B: Ch'ing-chen Hsien, Kuei-chu Hsien, Hsiu-wen Hsien, Kweichow
C: Wu Chiang
D: See No 31 below
E: 1943
F: 2,700 sq km
G: Total length, 100 km. Below Wu-li-ch'iao in a distance of 52 km the drop in elevation is 380 meters
I: 5 sites -- in the limestone gorges of the lower reaches
K: 50,000 kw
L: These developments would be near the most important aluminum ore fields in Kweichow

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31. A: Branches of the Mao-t'iao Ho
B: Kweichow Province
C: Mao-t'iao Ho, Wu Chiang, Ch'ang Chiang
D: Li-kuan Ho, Hsiu-wen Ho, Ta-ch'iao Ho, Hsiao-ch'iao Ho, An'liu Ho, Pai-shui
E: 1943
G: These streams are short and have steep descent
I: 9 possible sites for development
K: 10,000 kw
L: Work has already begun on a development at the confluence of the Hsiu-wen Ho and the Mao-t'iao Ho [near 26 40, 106 30]

32. A: Nan-ming Ho
B: Kuei-chu Hsien, Kweichow
C: Ch'ing-shui Chiang [confluence near 26 35, 106 43]
E: 1942
F: 2,100 sq km
G: Total length, 130 km; 56 km from Chung-ts'ao-ssu to Le-p'ing
H: 180 meters
I: 2 sites -- Wu-tang [26 39, 106 49] and Hsiao-t'an
K: 3,500 kw

33. A: Fu-jung Chiang; lower section
B: T'ung-tzo Hsien [28 08, 106 19], Kweichow Province
C: Wu Chiang; Ch'ang Chiang
E: 1942
F: 8,000 sq km
G: 200 km whole length; 33 km Yu-k'ou-t'an to confluence
H: 140 meters
I: 1 site, at confluence with Wu Chiang
K: 60,000 kw

34. A: Ch'ing Chiang
B: Rises where boundaries of Hupeh, Hunan, and Szechwan meet
C: Ch'ang Chiang; confluence near I-tu [30 24, 111 29] in Hupeh
E: 1942
F: 20,800 sq km
G: 420 kw whole length; 300 km from Liang-ho-k'ou to Ch'ang Chiang
H: 420 meters
I: 10 possible sites -- Ya-ch'i-tu, Feng-shui-ho, Yang-liu-ch'ih, Chung-tu-k'ou, Ch'ing-t'an, Ch'ang-yen-wu, Ch'ing-lin-tzu, Pa-shan, Wan-jen-yen, and Mo-shih
K: 320,000 kw. There are a number of other places where each could produce 1,000 kw more or less, and a still greater number of places where smaller amounts of waterpower are being or might be utilized. This is one of the regions in China richest in hydraulic power potentialities

35. A: Han Chiang; upper reaches
B: Rises in southern Shensi flows across northwestern Hupeh
C: Ch'ang Chiang; confluence at Han-k'ou [30 33, 114 17]
E: 1947
F: Drains an immense area; volume of flow is very great
G: 330 km from Ch'eng-ku to An Yang [32 41, 109 10]
H: 240 meters

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I: 10 possible sites. The two best are at Lien-hua-yen and Huo-shih-yai; the others are at Chao-pi-t'an, Ta-mai-ti-wan, Pieh-t'an, Wei-men, San-hua-shih, San-tao-chia, Kuan-yin-yen, and Hsiao-ch'a-yuan-wan.
J: A dam at least 100 meters high might be built at both of the first two places

K K: 900,000 kw
L: River traffic and flood control would be benefited by such development

36. A: (1) Pao Ho; (2) Hsu-shui; (3) Leng-shui Ho
B: Southwest Shensi
C: Han Chiang; confluences near Nan-cheng (Han-chung) [32 05, 107 04]
E: 1940

(1) Pao Ho
I: 4 good sites -- T'ieh-fo-tien, Ma-tao-i, Kuan-kou, and Shih-men
K: 14,000 kw

(2) Hsu-shui
I: 3 sites -- Lo-chia-pa, T'u-ti-ang, and Sheng-hsien-k'ou
K: 5,400 kw

(3) Leng-shui Ho
I: 4 sites -- Liu-shu-kou, Mou-chia-pa, Ch'a-fang-tzu, and Tsu-shih-tien
K: 3,000 kw

37. A: Tzu-shui Ho
B: Hunan Province
C: Ch'ang Chiang
D: Fu-i-shui
E: 1942; 1943
F: This is a large river and drains a large area
G: 270 km from Shao-yang [27 15, 111 23] to near I-yang [28 43, 117 22]
H: 140 meters
I: 2 sites -- Hsiao-chi and Tung-p'ing
K: 200,000 kw
L: On the upper reaches of the Tzu-shui Ho above Shao-yang and its tributary, the Fu-i-shui, there are 8 sites suitable for development, with an aggregate potential of 100,000 kw

38. A: Hsiu-shui Ho
B: Kiangsi Province; in Hsiu-shui Hsien, Wu-ming Hsien, Yung-hsiu Hsien
C: Flows into P'o-yang Hu, near [29 00, 116,00]
D: Wu-ning-shui, An-p'ing-shui, Tung-chiang-shui, Liao-shui
E: 1942; 1947
G: 330 km
I: 2 sites on the Hsiu-shui at Wu-li-t'ing and Mei-ling;
2 sites on the Wu-ning-shui at Lung-t'an-hsia and Wei-k'ou-t'an
K: 20,000 kw (total potential)

39. A: (1) Fu-shui; (2) Lu-shui
B: Hupeh Province; T'ung-shan and Yang-hsin Hsiens
C: Ch'ang Chiang
E: 1947

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(1) Fu-shui
G: 180 km
I: 1 site at Chu-chia-pa
K: 200 kw

(2) Lu-shui
G: 180 km
I: 2 sites -- Hung-k'ou and Lu-ssu-t'an
K: 3,000 kw

40. A: Liao-shui
B: Kiangsi Province; An-i, Ching-an, Feng-hsin and Yung-hsiu Hsiens
C: Hsiu-shui Ho; confluence at Wan-chia-fou [28 52, 115 45]
D: 3 branches, the North, Middle and South Forks
E: 1947
F: 3,700 sq km
G: 30 km
I: 3 sites -- Miao-chen on the North Fork, and Fu-chen and Hsia-pao-shan on the South Fork
K: 3,000 kw

III. THE CHU CHIANG SYSTEM (PEARL RIVER)

1. A: Pa-p'an Chiang
B: Source in Yunnan; flows across Kweichow
C: Branch of the Nan-p'an Chiang
E: 1939
F: 670 sq km
G: 70 km
H: 150 meters
I: 4 sites -- Hsiao-t'ieh-shui, Hsiao-t'ieh-shui-hsia, Ta-t'ieh-shui, and Yen-tzu-chiao
K: 14,000 kw

2. A: Nan-p'an Chiang; upper section
B: Rises in Yunnan and flows across Kweichow
C: Hsi Chiang (West River)
D: Pa-p'an Chiang
E: 1938, Lu-liang [25 02, 103 38] to P'u-hsi, below Liu-feng-ts'un
H: 200 meters
I: 5 sites -- Ta-lo-chi, Ta-t'ieh-shui, Shang-ko, Pi-lao and No-tsu
K: 140,000 kw

3. A. Ta-rang Ho
B: Huang-kuo-shu [26 04, 105 43] Kweichow Province
C: Pei-p'an Chiang
D: Includes the famous Huang-kuo-shu waterfall
E: 1941, the Huang-kuo-shu region
G: Within 5.4 km, including the waterfall
H: 235 meters
I: 3 sites -- Tou-pei-t'an, Hsi-niu-t'an, and Lo-ssu-t'an
K: 25,000 kw

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4. A: Liu Chiang
B: Kwangsi Province; near Liu-chou [24 18, 109 16]
C: Hsun Chiang
D: Lung Chiang and Yung Chiang
E: 1938
H: 7 meters, if a channel were cut across the bend from Huang-ts'un to Chi-la. This could shorten the boat distance by 60 km
K: If a high dam were built at Chi-la, 90,000 kw

5. A: Weng Chiang
B: Kwangtung Province; Weng-yuan and Ying-te Hsiens
C: Pei Chiang (North River); confluence near Ying-te [24 12, 113 21]
E: 1933, 1942, 1946, 1947, and 1948

1933 Survey (consulting engineers, Siemens Co (German))
I: Huang-kang, near Ying-te
K: 40,000 kw

1947 Survey (consulting engineers, Meng-te Co (Canadian))
I: Dam site at some point below Huang-kang, such as Ch'ang-lu or Yu-shu-k'eng

1948 Survey (National Resources Commission)
I: Yu-shu-k'eng decided upon as site of dam and powerhouse
J: 50 meters
K: 40,000 kw in first stage; ultimately 80,000 kw

6. A: Wu-Shui
B: Source in T'ung-pai shan in Hupeh; flows into Lo-ch'ang and Ch'u Hsiens in Kwangtung Province.
C: Pei Chiang (North River)
D: Chen-shui (joins Wu-shui at Ch'u-chiang (Kukong) [24 50, 113 33])
Pai-sha-shui, T'ien-t'ou-shui, and Yang-ch'i
E: 1941
F: 6,600 sq km
G: 250 km
I: Possible site at Yang-ch'i
K: Several hundred kilowatts only. The land here is comparatively flat; furthermore, the Yueh-han Railroad (Canton-Hankow Railroad) closely parallels this section of the river, hence there is little prospect of any development here.

7. A: Chen-shui
B: Rises in the southern slopes of the Mei-ling Shan in Kiangsi and enters Nan-hsiung Hsiens in Kwangtung
C: This is the main branch of the Pei Chiang; it is the principal artery of water traffic between Kwangtung and Kiangsi
E: 1941
H: The valley is wide and the descent very gradual; hence, there is small prospect of hydraulic development here

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IV. CHEKIANG-FUKIEN REGION

1. A: Ch'ien-t'ang Chiang
   B: This is one of the largest rivers in southeast China, and flows into the sea past Hang-chou [30 17, 120 10]
   D: Numerous tributaries; the main branch is also known as the Ch'u Chiang as it flows past Ch-u'hsien [28 57, 118 52]
   E: 1941; 1947
   F: 47,000 sq km; heavy rainfall area
   G: Main stream is some 600 km long
   H: River bed has sections of relatively steep descent
   I: 3 sites best suited for development are situated at Lu-tz'u-fou, Huang-t'an-k'ou, and Chieh-k'ou. 3 other possible sites at Lo-t'ung-fou, Shao-ts'un and Hui-fou.
   K: 220,000 kw

2. A: Ou Chiang
   B: Drains portions of several hsiens in Chekiang Province and enters the sea near Yung-chia (Wen-chou) [28 01, 120 38]
   D: Ta-ch'i, Sung-yin-ch'i, Hao-ch'i, Hsiao-ch'i
   E: 1941
   G: 100 km
   I: 2 sites -- Chu-ts'un [28 12, 119 35] and Shuang-chiang [28 58, 120 57] on the Ta-ch'i
   K: 5,000 kw

3. A: (1) Fei-yun Chiang; (2) Hsiao-ch'i

   (1) Fei-yun Chiang
   B: T'ai-shun Hsien in Chekiang; flows into the sea
   G: 100 km
   I: 5 sites -- Hsien-chu-ch'i, San-ch'a-ch'i, Chiu-ch'i, Ying-ch'ien, Chao-shan-tu
   K: 20,000 hp

   (2) Hsiao-ch'i
   B: Ch'ing-yuan, Ch'ing-ning Hsien, Chekiang
   C: Ou Chiang; confluence near Ch'ing-t'ien [29 09, 120 17]
   D: Nan-yang-ch'i
   E: 1935
   G: 100 km
   H: These streams flow through mountainous country; descent is rapid
   I: 3 sites -- Ta-chun, T'an-t'ou, and Nan-an-ts'un
   K: 20,000 hp
   L: Intended to supply the electric power needs of the salt-water electrolysis and refining plant near Yung-chia (Wen-chou).

4. A: Ku-t'ien-ch'i
   B: Fukien
   C: Min Chiang
   E: 1947
   F: 1,700 sq km
   G: 90 km
   H: 700 meters, in whole length
   I: In upper region, 2 sites for reservoirs at Pan-chung and Yang-ku; on lower section, 6 sites at Pan-keng-t'ing, Ts'ao-yang-ch'i, Lung-t'ing, An-lin-ts'un, and elsewhere
   K: 70,000 kw
   L: Careful surveys have been made in the vicinity of the dam site at Pan-keng-t'ing and plans for development are completed.

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5. A: Chiu-li Hu
B: P'u-t'ien Hsien, Fukien Province
C: Chu-ch'i
E: 1947
H: 460-meter drop within 2 km of the Lei-hung-pao (waterfall). This stretch included 9 waterfalls.
L: The volume of water is considered too small for development, but further study should be given to its utilization

V. OTHER PLACES

1. A: Nan-wan Ho
B: On the border of Yunnan and Burma
C: Joins the Jui-li Chiang, near Lei-yun
E: 1941
F: 150 sq km
I: One site on its upper reaches
K: A few hundred kilowatts
L: The lower reaches of the Jui-li Chiang are too flat for power development

2. A: Erh Ho
B: This is the outlet for the Ta-li-erh Hai near Ta-li [25 45, 100 15] Yunnan
C: Yang-p'i Chiang
E: 1939
G: 20 km
H: 600 meters
I: 5 sites -- Hsia-kuan, T'ien-sheng-ch'iao, Ma-feng-yuan, T'ieh-so-ch'iao, and P'i-chiang-k'ou
K: 100,000 kw

3. A: Possible small developments
B: In Sinkiang Province
E: In 1944 surveys were made near (1) Ti-hua [43, 48, 87 36] and (2) Ha-mi [42 48, 93, 27]
I: 2 sites near Ti-hua at Huang-ch'u and Shui-mo-kou
1 site near Ha-mi, at Hsi-hö-pa
K: Several tens of kilowatts

VI. CONCLUSION

The latest estimate by the Hydroelectric Power Commission concerning the hydroelectric power resources of the country is that they amount to not less than 136 million kilowatts. The foregoing list of potential power-development locations is by no means exhaustive.

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