

2.3 FUND REQUIREMENT FOR CONSTRUCTION

For predicting the financial requirement of the project construction at the implementation time, the project cost is estimated on the basis of two different construction system, namely, contract system and force account system. It is assumed that the project construction will be executed by a contractor or contractors selected through international competition in case of contract system, while most of the construction works will be carried out by the Government itself in case of force account system.

Two different estimates of the fund requirement are made based on the following conditions:

Contract system (contract base)

1. The cost for land acquisition is estimated on the basis of the actual purchasing cost,
2. The cost for machinery and equipment is estimated on the basis of their depreciation,
3. Cost escalation /1 during construction is incorporated; 8 % per annum during the period of 1976 - 1979 and 7 % in and after 1980 for foreign portion and 15% during the period of 1976 - 1979 and 10 % per annum in and after 1980 for local portion.

Force account system (force account base)

1. The cost for land acquisition is estimated on the basis of the actual purchasing cost,
2. The cost for machinery and equipment is estimated on the basis of purchasing cost instead of depreciation,
3. Cost escalation /1 during construction is incorporated; 8 % per annum during the period of 1976 - 1979 and 7 % in and after 1980 for foreign portion and 15 % per annum during the period of 1976 - 1979 and 10 % per annum in and after 1980 for local portion.

Estimated fund requirements are US\$262.01 million and US\$277.08 million for the contract base and force account base, respectively as shown in Table II-13 to Table III-14. The disbursement schedule is also presented by each sector in Tables II-15 and II-16.

/1: The rate of price escalation is estimated by referring to "Price Forecast for Major Primary Commodities" prepared by IBRD, July, 1975 for foreign portion and to domestic price trend in Indonesia for local portion.

Table III-13 Fund Requirement for Construction
(Contract Base)

(10 ³ US\$)			
Item	Foreign Portion	Local Portion	Total
Dam & Reservoir	26,970	88,250	115,220
Hydropower	14,010	2,520	16,530
Irrigation <u>/1</u>	31,520	44,430	75,950
River Improvement <u>/1</u>	19,150	35,160	54,310
Total	91,650	170,360	262,010

Note: The same costs as estimated in the previous feasibility study are basically applied for dam and hydropower except the land acquisition and resettlement cost for dam which is revised, based on the results of the survey conducted by Gadjah Mada University in May 1975.

/1: Only the actual purchasing costs of land and houses to be acquired for the implementation of the project are included excluding the cost for resettlement such as transportation cost and new housing.

Table III-14 Fund Requirement for Construction
(Force Account)

(10 ³ US\$)			
Item	Foreign Portion	Local Portion	Total
Dam & Reservoir	26,970	88,250	115,220
Hydropower	14,010	2,520	16,530
Irrigation <u>/1</u>	34,270	47,880	82,150
River Improvement <u>/1</u>	27,700	35,480	63,180
Total	102,950	174,130	277,080

Note: The estimated construction costs for dam and hydropower are based on the contract base.

/1: Only the actual purchasing costs of land and houses to be acquired for the implementation of the project are included excluding the cost for resettlement such as transportation cost and new housing.

Table III-15 Annual Disbursement of Fund Requirement

	1976	1977	1978	1979	1980	1981	1982	1983	Total
	(10 ³ US\$)								
	-Contract Base-								
<u>Dam & Reservoir</u>									
Foreign	1,200	5,270	5,920	9,170	5,410	-	-	-	26,970
Local	1,270	14,570	26,810	35,630	9,970	-	-	-	88,250 (115,220)
<u>Hydropower</u>									
Foreign	200	-	-	9,610	4,200	-	-	-	14,010
Local	40	-	-	270	2,210	-	-	-	2,520 (16,530)
<u>Irrigation</u>									
Foreign	-	1,300	4,840	7,240	7,090	5,850	5,200	-	31,520
Local	-	1,040	5,530	8,120	10,300	10,460	8,980	-	44,430 (75,950)
<u>River Improvement</u>									
Foreign	-	450	5,660	2,450	2,010	2,190	2,000	4,390	19,150
Local	-	170	4,190	5,380	5,280	6,670	5,820	7,650	35,160 (54,310)
<u>Total</u>									
Foreign	1,400	7,020	16,420	28,470	18,710	8,040	7,200	4,390	91,650
Local	1,310	15,780	36,530	49,400	27,760	17,130	14,800	7,650	170,360
Total	2,710	22,800	52,950	77,870	46,470	25,170	22,000	12,040	262,010

Table III-16 Annual Disbursement of Fund Requirement

	1976	1977	1978	1979	1980	1981	1982	1983	Total
	-Force Account-								(10 ³ US\$)
<u>Dam & Reservoir</u>									
Foreign	1,200	5,270	5,920	9,170	5,410	-	-	-	26,970
Local	1,270	14,570	26,810	35,630	9,970	-	-	-	88,250 (115,220)
<u>Hydropower</u>									
Foreign	200	-	-	9,610	4,200	-	-	-	14,010
Local	40	-	-	270	2,210	-	-	-	2,520 (16,530)
<u>Irrigation</u>									
Foreign	-	1,300	11,290	6,240	6,020	5,070	4,350	-	34,270
Local	-	1,150	6,520	8,680	10,920	11,020	9,590	-	47,880 (82,150)
<u>River Improvement</u>									
Foreign	-	650	13,060	1,990	1,600	1,590	1,800	7,010	27,700
Local	-	170	4,230	5,430	5,330	6,730	5,870	7,720	35,480 (63,180)
<u>Total</u>									
Foreign	1,400	7,220	30,270	27,010	17,230	6,660	6,150	7,010	102,950
Local	1,310	15,890	37,560	50,010	28,430	17,750	15,460	7,720	174,130
Total	2,710	23,110	67,830	77,020	45,660	24,410	21,610	14,730	277,080

Note: The costs for dam and hydropower are estimate on the Contract Base.

2.4 REPAYMENT CAPABILITY

Repayment capability of the project construction cost is briefly investigated by preparing cash flow table on the basis of the expected project revenue and the estimated fund requirement with assumed financial conditions. (In the preparation of cash flow table, the fund requirement estimated in the case of force account is applied for the conservativeness of the analysis.)

The expected revenue for the Government from the Wonogiri Multipurpose Dam Project consists of direct one such as water charge /1 and power tariff /2 and indirect one such as increased tax income including land tax and reduced expenses on flood protection or damages. Expected savings of foreign currency by reducing the imports of rice are also a kind of indirect revenue in terms of foreign currency.

For the repayment analysis, the required fund for the project construction is assumed to be provided on the following conditions:

- Foreign currency portion of the project construction cost will be financed by bilateral or international organization with the interest rate of 3 % per annum and its repayment period of 30 years including 10 years of grace period.
- Local currency portion of the project construction cost will be financed by the budget allocation of the Government.

Under these conditions, an analysis is made to investigate how the direct revenue will be able to contribute to the repayment of the fund after covering the operation, maintenance and replacement cost and to estimate the required fund for the repayment which is to be provided by the Government subsidy. The results of the calculation are presented in Table III-17.

As is expected, the direct revenue is not sufficient to repay the fund but covers the required operation, maintenance and replacement costs. This is due to the characteristics of this multipurpose dam project that measurable direct revenue is very limited and the expected indirect revenue is difficult to estimate correctly although it is considerably large.

Required amount for repayment is estimated at US\$2.5 million to US\$7.0 million per year during the period of 1979 - 2005. This fund shall be provided by the Government subsidy most of which will be able to be allocated from the indirect revenue. Particularly, the expected savings of foreign currency /3 will attain large amount, which is anticipated to contribute to the fund repayment indirectly.

/1: Water charge = Rp.20,000/ha x 23,200 ha
= Rp.464,000,000/year (≐US\$1,120,000)

/2: Power tariff = Salable power 27,027 Mwh x Power rate US\$0.048/kWh
≐ US\$1,300,000/year

/3: Expected increase in rice production
(272,800 t - 87,747 t) x 0.52 ≐ 96,200 t
Savings in foreign currency
96,200 t x US\$450/t = US\$43,290,000

Table III-17 Cash Flow

Item Year	CASH OUT FLOW				CASH INFLOW					DIFFERENCE (A - B)		
	Capital Cost		ON & R	Interest	Loan Repayment	Total Out Flow (A)	Construction Fund		Direct Revenue Irrigation Power		Indirect/ Revenue or Subsidy	Total Inflow (B)
	Foreign	Local					Loan	Gov. Budget				
1976	1,400	1,310	-	20		2,730	1,400	1,310	-	-	2,710	20
77	7,220	15,890	-	210		23,320	7,220	15,890	-	-	23,110	210
78	30,270	37,560	20	710		68,560	30,270	37,560	-	-	67,830	710
79	27,010	50,010	50	1,970		78,640	27,010	50,010	-	2,500	79,520	880
80	17,230	28,430	70	2,240		47,970	17,230	28,430	-	2,500	48,160	190
81	6,660	17,750	580	2,990		27,580	6,660	17,750	80	1,300	28,290	710
82	6,150	15,460	690	2,780		25,080	6,150	15,460	200	1,300	25,610	530
83	7,010	7,720	800	2,980		18,510	7,010	7,720	360	1,300	18,890	380
84	(102,950)	(174,130)	840	3,090		3,930	(102,950)	(174,130)	520	1,300	4,320	390
85			840	3,090		3,930			670	1,300	4,470	540
86			840	2,090	5,150	9,080			820	1,300	9,120	40
87			840	2,930	5,150	8,920			990	1,300	9,290	370
88			840	2,780	5,150	8,770			1,080	1,300	9,380	610
89			840	2,630	5,150	8,620			1,120	1,300	9,420	800
90			840	2,470	5,150	8,460			1,120	1,300	9,420	960
91			840	2,320	5,150	8,310			1,120	1,300	8,420	110
92			840	2,160	5,150	8,150			1,120	1,300	8,420	270
93			840	2,000	5,150	7,990			1,120	1,300	8,420	430
94			840	1,850	5,150	7,840			1,120	1,300	8,420	580
95			840	1,700	5,150	7,690			1,120	1,300	8,420	730
96			840	1,540	5,150	7,530			1,120	1,300	8,420	890
97			840	1,390	5,150	7,380			1,120	1,300	7,420	40
98			840	1,230	5,150	7,220			1,120	1,300	7,420	200
99			840	1,080	5,150	7,070			1,120	1,300	7,420	350
2000			840	730	5,150	6,920			1,120	1,300	7,420	500
01			840	770	5,150	6,760			1,120	1,300	7,420	660
02			840	620	5,150	6,610			1,120	1,300	7,420	810
03			840	460	5,150	6,450			1,120	1,300	7,420	970
04			840	310	5,150	6,300			1,120	1,300	6,420	120
05			840	150	5,150	6,090			1,120	1,300	6,420	330
06			840	0	0	840			1,120	1,300	2,420	1,580
2025			840			840			1,120	1,300	2,420	1,580

Note: 1 Indirect revenue to be allocated for the repayment.

3. SOCIO-ECONOMIC IMPACTS

Besides the benefits explained in Economic Evaluation, favourable socio-economic impacts are expected to accrue from the implementation of the project such as impacts on regional economy and socio-economic stability.

Negative impact is also anticipated to come out from the project construction such as inflation and deterioration of local community life caused by reservoir construction, for which careful consideration should be given to minimize any possible adverse effects.

3.1 EMPLOYMENT OPPORTUNITY AND TRANSFER OF KNOWLEDGE

Substantial employment opportunity is created through the implementation of the project from the stage of construction to that of operation and maintenance. During the construction of irrigation facilities and river improvement works, the required manpower is estimated at 8,500 men/month and 4,600 men/month per year, respectively, while about 400 persons will be permanently required for the operation and maintenance work both of irrigation and river improvement.

Besides the considerable job opportunities to be created, the project implementation will provide good opportunities to the local staff in gaining experience in various work fields and improving their skills on the jobs. Through these, Indonesia will accumulate necessary knowledge and skill for the future development.

Employment opportunity is also expected to increase on farm by the introduction of intensive crop cultivation. Since there exist considerable unemployment and underemployment on farm in the project area, increased job opportunity to be created by the project will no doubt provide benefit for solving the unemployment problem.

3.2 REGIONAL ECONOMY AND SOCIAL STABILITY

Improvement of local transportation is expected through the construction of operation and maintenance road along the 170-km main canal 60-km levees along the main Sala river and tributaries. The expanded road system will not only facilitate the economic activities in the region particularly for agriculture but also contribute to inter-regional transportation and communication.

Increased agricultural production with the irrigation project will increase farm income in the region. This increased farm income will enhance the economic activity in the region through its multiple effects on other sectors of the economy.

Living conditions including health and sanitary conditions will be improved by the completion of the flood control measures combined with dam and river improvement works as well as through electrification by Wonogiri power station.

Socio-economic stability in the region will thus be promoted through all of the above mentioned effects. Particularly, the shift from near-subsistence farming to more intensive agriculture will contribute to the social security and stability.

3.3 NEGATIVE IMPACTS

One of the negative impacts on the regional economy would be a inflation caused by massive employment of laborers and purchasing of the materials for construction and consumptive goods during the construction period.

Major negative impact might come from the land acquisition required for the implementation of the project, particularly for construction of the reservoir which will submerge approximately 7,000 ha of the cultivated land with over 11,000 families living on it.

Although the people affected will be fully compensated for the loss of their lands and quarters, they will not be able to continue their livelihood as they used to. The community life in the adjacent area will also be seriously affected by the structural change of the community such as decrease in the number of village people, their relatives, and village facilities.

It is, therefore, contemplated that preparation of the reconstruction program of the local community is also an important problem as well as the resettlement of the displaced people and securing alternative employment for the successful execution of the project.

So far, preliminary and secondary surveys for the compensation of the submerged area were conducted by Gadjah Mada University. The last survey is now being undertaken, results of which are scheduled to be submitted in the middle of 1976. In December 1976, about 500 families in the area to be submerged will be transmigrated to Sumatra as the first step of the resettlement and the preparation is now being made by the Resettlement Committee.

