THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

THE MASTER PLAN SURVEY REPORT
ON
THE IRRAWADDY BASIN
INTEGRATED AGRICULTURAL DEVELOPMENT

ANNEX K

ECONOMY

MARCH 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

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ECONOMY

MARCH 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

CHINA

INDIA

KACHIN STATE

SAGAING

SHAN STATE

BANGLADESH

CHIN SPECIAL DIVISION

ARAKAN

MAGWE

MANDALAY

Bay of Bengal

KAYAH STATE

LAOS

PEGU

PROJECT AREA

THAILAND

IRRAWADDY

RANGOON

MON STATE

KAREN STATE

Andaman Sea

BANGKOK

TENASSERIM

Gulf of Thailand

LEGEND

Paved roads
Single track railway
Double track railway
Main rivers
International boundaries
Divisional boundaries

N

SCALE

0   100   200   300   400
Kilometers

0   50   100   150   200   250
Miles

Prome

Paukkaung

Padaung

Thegon

Paungde

Shwedaung

Nattalin

Kyangin

Zigon

Gyobingauk

Okpo

IRRAWADDY RIVER

Monyo

Myanaung

Minhla

Ingabu

Letpadan

Tharrawaddy

MITMAKA R.

Lemyethna

Henzada

BASSEIN R.

Yegyi

Kyonpyaw

Zalun

Taikkyi

Hlegu

Danubyu

Hmadot

SCALE

5   0   5   10   15   miles

10 5 0 5 10 15 20 15   km
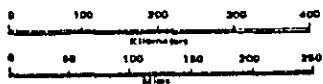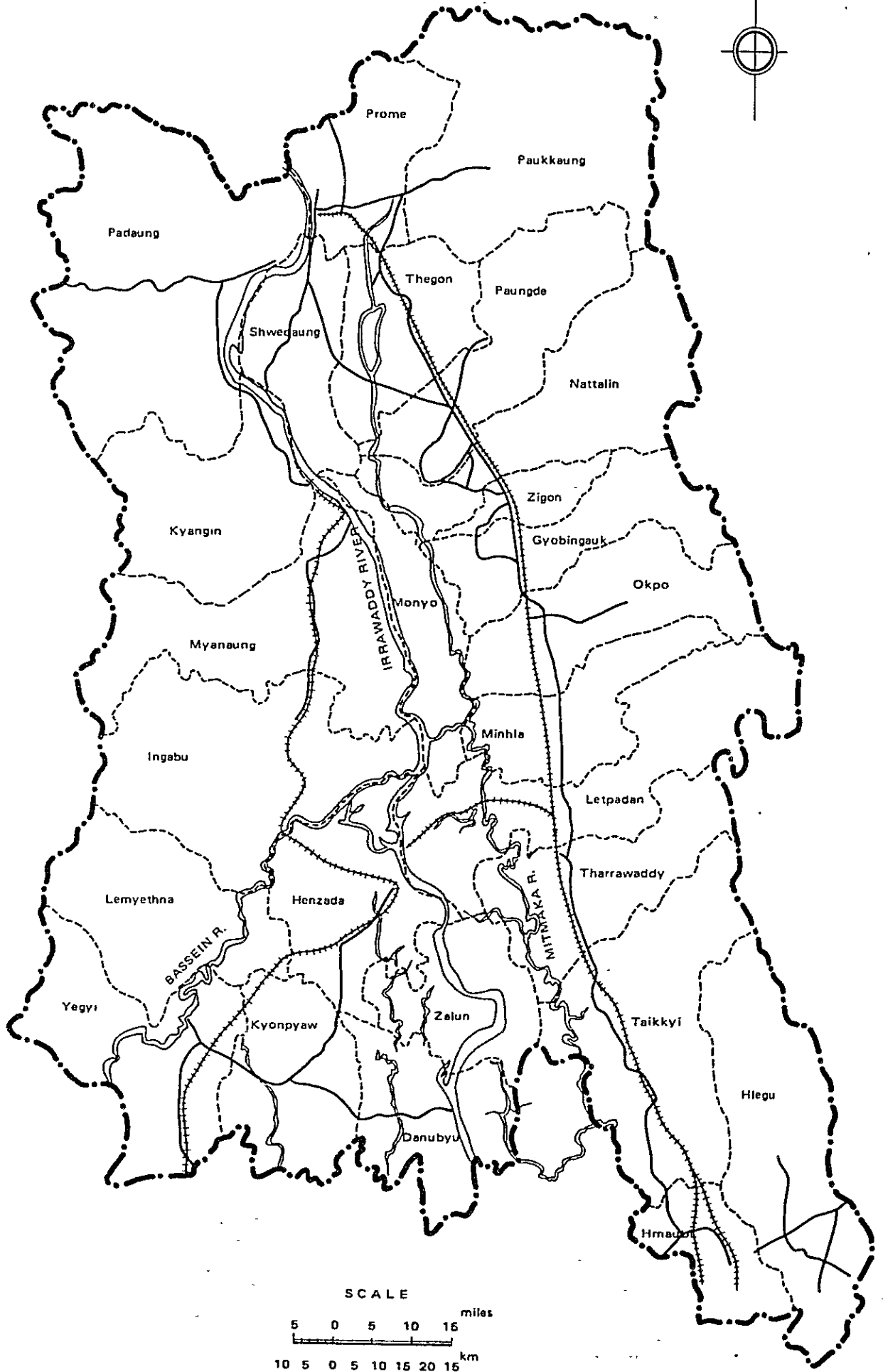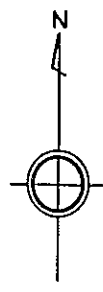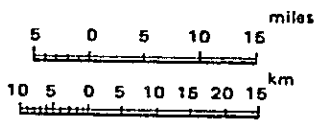
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ABBREVIATION, MEASURES AND GLOSSARIES

AC	Agriculture Corporation
ADB	Asian Development Bank
AE	Assistant Engineer
AGM	Assistant General Manager
AFPTC	Agricultural and Farm Produce Trade Corporation
AMD	Agricultural Mechanization Department
APS	Advance Purchase System
Ave	Average
BAG	Bachelor of Agricultural University
BKT	Basket(s)
CIF	Cost Insurance and Freight
°C	Degree Centigrade
DAGM	Deputy Assistant General Manager
DG	Director General
DGM	Deputy General Manager
Dy	Deputy
EE	Executive Engineer
EL	Elevation
EPC	Electric Power Corporation
FC	Foreign Currency
FiD	Fishery Department
FERD	Foreign Economic Relations Department
FIC	Foodstuff Industries Corporation
FOB	Free on Board
FoD	Forest Department
F/S	Feasibility Study
FY	Fiscal Year from April to March
GM	General Manager
GNP	Gross National Product
GWH	Giga Watt Hour
HP	Horsepower

HWL	High Water Level
HYV	High Yielding Variety (of paddy)
Hz	Hertz per second
IBRD	International Bank for Reconstruction and Development
ID	Irrigation Department
IDA	International Development Association
KV	Kilo Volt
KW	Kilo Watt
KWH	Kilo Watt Hour
LC	Local Currency
LDMC	Livestock Development and Marketing Corporation
LIV	Local Improved Variety
LWL	Lower Water Level
LV	Local Variety
MAF	Ministry of Agriculture and Forests
MD	Managing Director
MHD	Meteorological and Hydrological Department
MI 1	Ministry of Industry No. 1
M/P	Master Plan
MPF	Ministry of Planning and Finance
MT	Ministry of Trade
MW	Mega Watt
MWL	Mean Water Level
PD	Project Director
pH	Potential of Hydrogen
PPFC	People's Pearl and Fishery Corporation, MAF
PPM	Part(s) per Million
%	Percent
PSD	Planning and Statistics Department
SD	Survey Department, MAF
SLRD	Settlements and Land Records Department, MAF
TC	Timber Corporation, MAF
TEM	Township Extension Manager
TSP	Triple Super Phosphate

UCC	University Computer Center
UGCF	Union Government Consolidated Fund
VAHD	Veterinary and Animal Husbandry Department
VTB	Village Tract Banks
WPSD	Working People's Settlement Department

Length

mm	millimeter (s)
cm.	centimeter (s)
m	meter (s)
km	kilometer (s)
inch	25.4 mm
ft	foot (feet) = 12 inch = 30.48 cm
mile	5,280 feet = 1.609 km

Area

sq.cm	square centimeter (s)
sq.m	square meter (s)
sq.km	square kilometer (s) = 100 ha
ac	acre (s) = 4,047 sq.m
sq.mile	square mile = 2.59 sq.km = 640 ac
ha	hectare

Capacity

ℓ	litter
cu.m	cubic meter
MCM	Million Cubic Meter
cu.ft	cubic foot (feet) = 28.32 ℓ
cu.yd	cubic yard = 0.765 cu.m
AF	Acre Foot (feet) = 1,233.48 cu.m
Qt	Quart = 1/4 gl = 1.136 ℓ (UK) = 0.946 ℓ (US)
gl	gallon = 4.543 ℓ (UK) = 3.785 ℓ (US)

Note: UK: British Measure
      US: US Measure

Weight

g	gram (s)
kg	kilogram (s)
ton	metric ton
oz	ounce = 28.4 g
lb	Pound = 16 oz = 0.454 kg

Others

cm/sec	centimeter per second
m/sec	meter per second
km/sec	kilometer per second
mile /hr	mile per hour= 1.609 km/hr = 0.447 m/sec
ft/second	feet per second
cu.m/sec	cubic meter per second
cfs/cu.sec	cubic foot (feet) per second = 0.0283 cu.m/sec
gl/sec	gallon per second = 4.543 ℓ/sec = 0.0757 ℓ/min

Glossaries

|	
lakh	100,000
crore	10,000,000
viss	1.633 kg
Pyi	2,127 kg
basket	20.9 kg (paddy)
basket	34.0 kg (rice)
bag	75.6 kg (rice)
Chaung	River or Stream
Kyat	Unit of Local Currency (about 30 Japanese Yen)
In	Lake or Swamp area
Yoma	Mountain range
1 US$	6.44 kyats

I.   NATIONAL ECONOMY

I.1   General Description

The Socilist Republic of the Union of Burma covers an area of
about 167 million acres (nearly 680,000 sq.km), roughly two times the
size of Japan, and has a tropical and monsoon climate. It borders on
China, Laos and Thailand to north and east, and India and Bangladesh
to west. The dominant physical feature of the Burma is the expansive
valley of the Irrawaddy river which flows south from the foothills
of the Tibetan plateau to the fertile delta on the Bay of Bengul.
It has four distinct climatic and topographical regions: the Western
and Northern Hills, the Shan Plateau, the Central Region, and·the
Arakan and Tenasserim Coastal regions. The Central Region is the
most densely settled and comprises a fertile lower wet zone, a central
dry zone and a northern wet zone. About 27% of the country or 45
million ac, is considered arable, but only some 20 million ac are
presently under cultivation. Another 5 million ac are fallow while
the remaining 20 million ac are classified as cultivable wasteland,
most of which is unsuitable for rice, the staple crop. Forests cover
about half of the country and contain many species of valuable
timber, particularly teak. Administratively, Burma is divided into
seven States and Seven Divisions. (See Figure K-1-1). Each Division
and State is subdivided into Townships.

Burma's population is estimated at about 32.2 million at the
end of March 1978 (See Table K-1-1), of which about 85 percent lives
in rural areas, mostly in the lower valleys of the three main rivers,
namely Irrawaddy, Salween and Sittang. The dominant ethnic group
is the Burmans who account for about 70 percent of the total
population. The minority ethnic groups consist of Karens, Shans,
Kachins and Chins. The estimated rate of population growth is 2.2
percent per annum for the period from 1961 to 1978. Population
density is about 123 per sq.mile (47 per sq.km) for the entire country
and 449 per sq.mile (173 per sq.km) for the arable land.

FIGURE K-1-1   KEY MAP
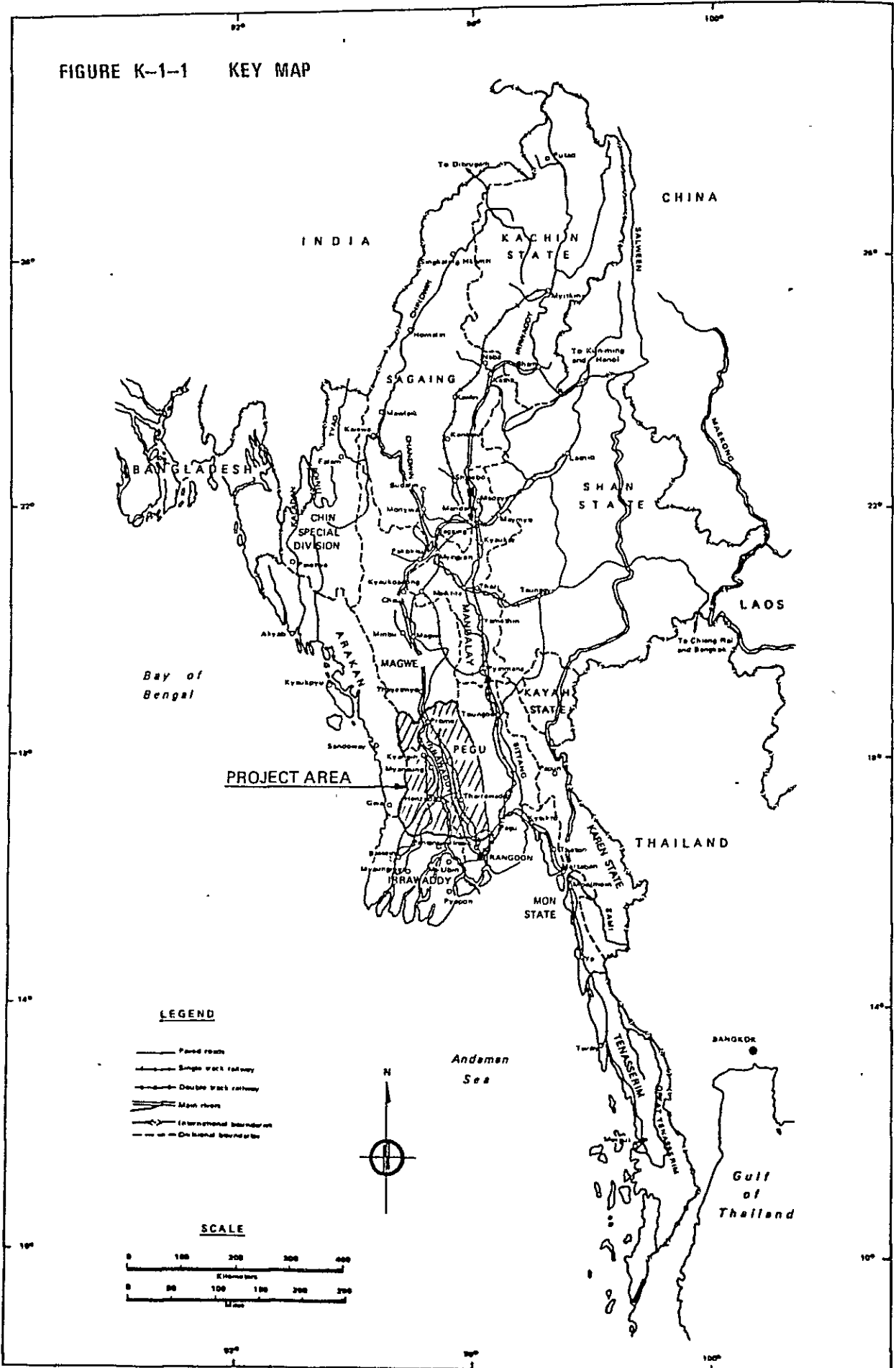
TABLE K-1-1   TOTAL POPULATION

Year	Total Population (Thousand)	Annual Growth Rate
1961	22,200	-
1962	22,688	2.20
1963	23,187	2.20
1964	23,697	2.20
1965	24,218	2.20
1966	24,751	2.20
1967	25,303	2.23
1968	25,867	2.23
1969	26,444	2.23
1970	27,034	2.23
1971	27,637	2.23
1972	28,262	2.26
1973	28,886	2.21
1974	29,521	2.20
1975	30,170	2.20
1976	30,834	2.20
1977	31,512	2.20
1978	32,206	2.20

Note: The above data from 1961 to 1978 shows the
        total population estimates existing at the
        end of March.

Source: Report to the Pyithu Hluttaw.

The population structure of Burma had not changed considerably
as shown in Table K-1-2. In reviewing the structural changes in
population during the 15 years period, working population in the
15-59 years age group declined from 54.9 percent in 1962 to 53.5
percent in 1977/78 reflecting an increase in the number of dependents.

Table K-1-3 shows composition of the estimated active labour
force of workers and peasants engaged in the state, co-operative and
private sectors. At the end of March 1978, the total active labour
force accounts for 12.64 million of which 1.3 million or 10.3
percent was engaged in the state sector and the remaining 89.7
percent in the co-operative and private sectors. The major portion
of the total active labour force was absorbed by the agriculture,
the trade and the processing and manufacturing sectors, of which
8.21 million was engaged in the agricultural sector, 1.21 million in
the trade sector and 0.93 million in the processing and manufactur-
ing sector.

Since independence in 1948, Burma has been working to unify
the country and to rebuild her economy. The initial task of nation-
building was compounded by the necessity of governing through a
coalition of widely divergent political interests and the continuing
need to establish control over various insurgent groups. When the
present Government assumed the control in 1962, parliamentary
democracy was declared a failure and a Revolutionary Council was
established with General Ne Win as its Chairman. At the same time,
only the Burma Socialist Programme Party (BSPP) was established
and authorized as a political party. In December 1973, a constitution
was adopted in a nation wide referendum. It vested supreme executive,
legislative, and judicial authority in the unicameral Pyithu
Hluttaw (People's Assembly) which consist of 451 members elected in
1974 to serve a four year term of office. During the recess of the
Pyithu Hluttaw, the Council of State exercises power on its behalf.

TABLE K-1-2 POPULATION BY AGE GROUP

(Population in thaousand)

	1962 Nos.	1962 %	1974 Nos.	1974 %	1975 Nos.	1975 %	1976 Nos.	1976 %	1977 Nos.	1977 %	1978 Nos.	1978 %	Annual Growth Rate 1962-1978
1. 0-14 Years Total	8,983	39.6	11,956	40.5	12,219	40.5	12,488	40.5	12,763	40.5	13,044	40.5	2.36
Male	4,538	40.3	6,016	41.0	6,148	41.0	6,283	41.0	6,421	41.0	6,562	41.0	2.33
Female	4,445	39.0	5,940	40.0	6,071	40.0	6,205	40.0	6,342	40.0	6,482	40.0	2.39
2. 15-59 Years Total	12,462	54.9	15,794	53.5	16,141	53.5	16,496	53.5	16,859	53.5	17,230	53.5	2.05
Male	6,161	54.6	7,776	53.0	7,947	53.0	8,122	53.0	8,301	53.0	8,484	53.0	2.02
Female	6,301	55.2	8,018	54.0	8,194	54.0	8,374	54.0	8,558	54.0	8,746	54.0	2.07
3. 60 Years & Above	1,243	5.5	1,771	6.0	1,810	6.0	1,850	6.0	1,890	6.0	1,932	6.0	2.79
Male	577	5.1	880	6.0	899	6.0	919	6.0	939	6.0	960	6.0	3.23
Female	666	5.8	891	6.0	911	6.0	931	6.0	951	6.0	972	6.0	2.39
4. Total	22,688	100.0	29,521	100.0	30,170	100.0	30,834	100.0	31,512	100.0	32,206	100.0	2.21
Male	11,276	100.0	14,672	100.0	14,994	100.0	15,324	100.0	15,661	100.0	16,006	100.0	2.21
Female	11,412	100.0	14,849	100.0	15,176	100.0	15,510	100.0	15,851	100.0	16,200	100.0	2.21

Source: Report to the Pyithu Hluttaw

TABLE K-1-3 ACTIVE LABOUR FORCE

	Percentage Distribution of Active Labor Force (%)						Estimated Active Labor Force in 1977 1/		
	1965	1970	1975	1976	1977	1978	State Sector	Cooperative & Private Sector	Total
1. Agriculture	64.76	66.74	65.76	65.54	65.31	64.97	73	8,139	8,212
2. Livestock & Fishery	1.49	1.57	1.29	1.30	1.30	1.32	8	159	167
3. Forestry	0.30	1.56	1.22	1.22	1.23	1.20	73	79	152
4. Mining	0.52	0.26	0.51	0.54	0.53	0.53	65	2	67
5. Processing & Manufacturing	7.35	6.86	7.01	7.08	7.09	7.35	160	769	929
6. Power	0.13	0.10	0.12	0.12	0.11	0.12	15	–	15
7. Construction	1.10	1.39	1.46	1.44	1.29	1.46	124	60	184
8. Transport & Communications	2.97	3.19	3.41	3.43	3.43	3.32	104	316	420
9. Social Services	}5.12	1.28	2.00	2.01	2.08	1.95	174	72	246
10. Administration	}	2.99	3.54	3.81	3.84	3.82	459	24	483
11. Trade	7.36	8.86	9.13	9.03	9.36	9.54	45	1,161	1,206
12. Workers n.e.s.	8.90	5.20	4.55	4.48	4.43	4.42	–	559	559
13. Total	100.00	100.00	100.00	100.00	100.00	100.00	1,300	11,340	12,640

Note: 1/ in thousand

Source: Report to the Pyithu Hluttaw, Ministry of Planning and Finance

The guiding philosophy of the Government, as stated in the April 1962 document on the "Burmses Way to Socialism", is based on a combination of traditional Burmese values and socialist doctrine. Nationalist in character, it provided the doctrinal base for sweeping measure to eliminate the extensive domination of the economy by British, Indian and Chinese interests. Its economic objectives are set out in the Twenty Year Plan. Adopted by the BSPP in 1972, it is to be implemented through a succession of five four Year Plans. The intent is to fashion a new order for Burma by reorienting the economy to provide adequate food, clothing, and shelter for the masses and to improve the quality of social services. These goals are to be achieved by transforming existing institutions to meet the needs of society. They have entailed the replacement of parliamentary democracy with a socialism democracy and continuing efforts by the Party and Government to unify the country and politicize the population. They have also involved nationalization of the major means of production with the notable exception, in practice, of agriculture. Nevertheless, private sector activity still remains substantial even in the non-agricultural sectors, accounting for significant portion of forestry and fishery industries.

I.2   Macro-Economic Performance

In the last ten years, Burma has achieved a modest acceleration in her ecnonmic growth. While a nominal growth rate of GDP accounted faor 13.3 percent per annum over the period, a real GDP growth was 3.6 percent per annum (See Tables K-1-4 and K-1-5). Important contributory factors were: the increasing emphasis on agricultural development; the design and application of more rational pricing policies for agricultural produce and the products of State Economic Enterprises (SEEs); the measures taken to improve efficiency in the operations of public enterprises; and the execution of a major fiscal reform effort. However, an important part of the progress achieved was also weather-related. The economy benefitted from

TABLE K-1-4   VALUE OF PRODUCTION OF GOODS AND SERVICES
(At current producer's prices)

(Unit: Million Kyat)

	1961/62	66/67	67/68	68/69	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77 [1]	77/78 [2]
1. Goods	7,228	9,100	10,400	10,962	11,203	11,391	11,448	12,853	16,099	20,845	26,664	30,896	35,034
Agriculture	2,169	2,751	3,319	3,457	3,469	3,485	3,510	4,353	6,156	8,883	11,400	13,037	14,407
Livestock & Fishery	473	819	884	868	946	1,031	1,055	1,038	1,183	1,549	1,778	2,171	2,695
Forestry	338	372	391	408	399	437	494	474	431	468	496	539	632
Mining	94	138	154	204	192	208	260	302	354	368	302	372	550
Processing & Manufacturing	3,589	4,306	4,917	5,227	5,409	5,470	5,381	5,899	7,226	8,822	11,845	13,838	15,579
Power	66	77	82	87	94	102	101	111	116	114	126	139	155
Construction	499	637	653	711	694	658	647	676	633	641	717	800	1,016
2. Services	2,718	3,038	3,117	3,245	3,419	3,528	3,778	4,192	4,288	4,712	4,930	5,389	6,001
Transportation	791	937	902	952	973	1,014	1,062	1,055	1,043	1,171	1,256	1,280	1,487
Communications	31	31	41	37	39	44	46	42	45	49	49	61	56
Financial Institut.	144	134	161	149	129	148	183	237	230	303	242	405	374
Social & Admin. Services	1,090	1,169	1,228	1,311	1,415	1,440	1,585	1,909	1,998	2,196	2,361	2,568	2,980
Rental & Other Services	662	768	785	796	863	882	902	949	972	993	1,022	1,075	1,104
3. Trade	2,227	2,438	2,840	2,986	3,116	3,164	3,307	3,624	4,963	6,744	8,356	9,620	10,687
4. Total (1+2+3)	12,173	14,576	16,357	17,193	17,738	18,083	18,533	20,669	25,350	32,301	39,950	45,905	51,722
5. Total Inter Industry Use	5,514	6,378	7,014	7,277	7,477	7,644	7,760	8,935	10,650	12,953	16,473	18,890	21,335
6. Total Net Output (4 - 5)	6,659	8,198	9,343	9,916	10,261	10,439	10,773	11,734	14,700	19,348	23,477	27,015	30,387

Note: 1/ Provisional Actual 2/ Provisional
Source: Report to the Pyithu Hluttaw 1978-79

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TABLE K-1-5   VALUE OF PRODUCTION OF GOODS AND SERVICES

(At 1969-70 constant producer's prices)

(Unit: Million Kyat)

	1961/62	66/67	67/68	68/69	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77 [1]	77/78 [2]
1. Goods	8,169	9,410	10,478	10,719	11,010	11,425	11,466	10,665	10,910	11,056	11,757	12,391	13,409
Agriculture	2,511	2,665	3,107	3,189	3,276	3,476	3,545	3,291	3,619	3,565	3,729	3,897	4,092
Livestock & Fishery	566	828	893	874	946	1,032	1,056	920	1,030	1,021	1,071	1,108	1,167
Forestry	342	393	404	401	399	427	424	413	363	420	405	426	487
Mining	180	179	180	203	192	213	235	246	210	210	215	247	313
Processing & Manufacturing	4,455	4,631	5,159	5,254	5,409	5,517	5,458	5,026	4,967	5,117	5,584	5,904	6,447
Power	66	77	82	87	94	102	101	111	116	114	126	139	155
Construction	499	637	653	711	694	658	647	658	605	609	627	670	748
2. Services	2,722	3,038	3,114	3,236	3,419	3,530	3,777	4,018	4,007	4,233	4,367	4,671	5,030
Transportation	795	937	899	943	973	1,016	1,061	1,043	995	1,029	1,046	1,039	1,112
Communications	31	30	41	37	39	44	46	42	45	47	47	56	51
Financial Institut.	144	134	161	149	129	148	183	237	230	253	215	326	307
Social & Admin. Services	1,090	1,169	1,228	1,311	1,415	1,440	1,585	1,747	1,765	1,911	2,045	2,213	2,496
Rental & Other Services	662	768	785	796	863	882	902	949	972	993	1,014	1,037	1,064
3. Trade	2,728	2,514	2,859	2,876	3,007	3,030	3,170	3,215	3,247	3,366	3,494	3,664	3,862
4. Total (1+2+3)	14,069	14,962	16,451	16,831	17,436	17,985	18,413	17,898	18,164	18,655	19,618	20,726	22,301
5. Total Inter Industry Use	6,269	6,607	7,250	7,328	7,460	7,595	7,771	7,360	7,351	7,552	8,056	8,482	9,267
6. Total Net Output (4 - 5)	7,800	8,355	9,201	9,503	9,976	10,390	10,642	10,538	10,813	11,103	11,562	12,244	13,034

Note: 1/ Provisional Actual 2/ Provisional
Source: Report to the Pyithu Hluttaw 1978-79

generally favorable weather conditions following the unprecedented
floods of 1974/75 when agricultural output declined. While many of
the policies and programs initiated during the Plan period have
improved the conditions for growth, the case remains a more intensive
developmental effort, if the economy is to grow along a higher and
more stable path.

Table K-1-6 shows the value of net national output (G.D.P.)
by sector and the structure of Burma's economy has not changed
significantly since 1961/62, as shown in Table K-1-7. Table K-1-8
gives shares of G.D.P. by the state, the co-operatives and the
private sectors, showing that the share of the state sectors increased
from 24.8 percent in 1961/62 to 35.9 percent in 1977/78, that of the
co-operative sector also increased from 0.7 percent to 3.3 percent,
and contrarily that of the private sector declined from 74.5 percent
to 60.8 percent.

The growth of value added by the agricultural sector including
livestock and fishery averaged 3.2 percent per annum during 1968/69
to 1977/78. Net output from the cultivation of paddy which accounts
for some 45 percent of agricultural value added grew by about 3.0
percent per annum. It stagnated in 1974/75, expanded by over 8 percent
the next year and grew by just 1 percent in 1976/77. The principal
sources of agricultural growth were the output of other cereal crops
(mainly wheat), beans and pulses, tobacco, and spices, accounting
together for some 20 percent of agricultural output.

A complex set of policy, institutional and technological
problems affect the agricultural sector. Government programs have
endeavored to address some of them through improvements in farm
practices and expansion of the sown area by bringing fallow and
waste land into cultivation through reclamaion and flood protection
works. Agricultural procurement price policies also have been used
to improve the composition and speed up the pace of agricultural

TABLE K-1-6 VALUE OF NET NATIONAL OUTPUT
(At 1969-70 constant producer's prices)

(Unit: Million Kyat)

	1961/62	66/67	67/68	68/69	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77 [1]	77/78 [2]
1. Goods													
– Agriculture	2,028	2,162	2,592	2,647	2,713	2,896	2,954	2,765	3,023	2,963	3,122	3,306	3,493
– Livestock & Fishery	435	644	695	679	736	804	824	715	803	794	834	862	909
– Forestry	226	253	263	263	258	282	277	272	236	272	263	278	318
– Mining	105	88	94	91	111	149	137	139	120	117	120	139	179
– Processing & Manufacturing	818	949	996	1,017	1,071	1,107	1,107	1,081	1,054	1,098	1,200	1,284	1,382
– Power	36	45	49	53	61	67	65	72	89	89	97	107	117
– Construction	151	193	203	218	212	203	200	204	188	191	200	217	239
– Sub-total	3,799	4,334	4,892	4,968	5,162	5,508	5,564	5,248	5,513	5,524	5,836	6,194	6,637
2. Services													
– Transportation	449	515	411	523	585	586	609	587	555	573	585	589	633
– Communications	26	25	35	32	33	38	40	35	38	40	40	48	43
– Financial Institutions	88	94	137	124	112	129	169	204	184	217	146	214	209
– Social & Admin. Services	575	620	654	765	815	838	903	1,031	1,038	1,147	1,233	1,318	1,461
– Rental & Other Services	575	662	675	682	749	750	757	795	822	840	859	878	901
– Sub-total	1,713	1,916	1,912	2,126	2,294	2,341	2,478	2,652	2,637	2,817	2,863	3,047	3,247
3. Trade	2,286	2,106	2,396	2,409	2,519	2,539	2,600	2,637	2,663	2,760	2,863	3,004	3,150
4. Total Net Output	7,798	8,356	9,200	9,503	9,975	10,388	10,642	10,537	10,813	11,101	11,562	12,245	13,034

Note: 1/ Provisional Actual, 2/ Provisional
Source: Report to the Pyithu Hluttaw 1978-79

STRUCTURAL CHANGES IN NET NATIONAL OUTPUT
(At 1969-70 constant producer's prices)

(Unit: %)

	1961/62	66/67	67/68	68/69	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77 [1]	77/78 [2]
1. Goods													
- Agriculture	26.0	25.9	28.2	27.8	27.2	27.9	27.8	26.2	28.0	26.7	27.0	27.0	26.8
- Livestock & Fishery	5.6	7.7	7.6	7.1	7.4	7.7	7.7	6.8	7.4	7.1	7.2	7.0	7.0
- Forestry	2.9	3.0	2.9	2.8	2.6	2.7	2.6	2.6	2.2	2.4	2.3	2.3	2.4
- Mining	1.3	1.1	1.0	1.0	1.1	1.4	1.3	1.3	1.1	1.1	1.0	1.1	1.4
- Processing & Manufacturing	10.5	11.4	10.8	10.7	10.7	10.7	10.4	10.3	9.8	9.9	10.4	10.5	10.6
- Power	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.9	0.9
- Construction	1.9	2.3	2.2	2.3	2.1	2.0	1.9	1.9	1.7	1.7	1.7	1.8	1.8
- Sub-total	48.7	51.9	53.2	52.3	51.7	53.0	52.3	49.8	51.0	49.7	50.4	50.6	50.9
2. Serivces													
- Transportation	5.8	6.2	4.5	5.5	5.9	5.6	5.7	5.6	5.1	5.2	5.1	4.8	4.9
- Communications	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.3
- Financial Institutions	1.1	1.1	1.5	1.3	1.1	1.2	1.6	1.9	1.7	1.9	1.3	1.7	1.6
- Social & Admin. Services	7.4	7.4	7.1	8.1	8.2	8.1	8.5	9.8	9.6	10.3	10.7	10.8	11.2
- Rental & Other Services	7.4	7.9	7.3	7.2	7.5	7.2	7.1	7.6	7.6	7.6	7.4	7.2	6.9
- Sub-total	22.0	22.9	20.8	22.4	23.0	22.5	23.3	25.2	24.4	25.4	24.8	24.9	24.9
3. Trade	29.3	25.2	26.0	25.3	25.3	24.5	24.4	25.0	24.6	24.9	24.8	24.5	24.2
4. Total Net Output	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: 1/ Provisional Actual, 2/ Provisional
Source: Report to the Pyithu Hluttaw 1978-79

TABLE K-1-8 SHARES OF VALUE OF NET OUTPUT BY SECTOR

(Unit: Kyat million)

	1961/62				1973/74				1974/75				1975/76				1976/77 [1]				1977/78 [2]			
	State	Co-op	Private	Total	State	Co-op	Private	Total	State	Co-op	Private	Total	State	Co-op	Private	Total	State	Co-op	Private	Total	State	Co-op	Private	Total
1. Goods																								
-Agriculture	-	-	2,028	2,028	4	-	3,019	3,023	5	0	2,958	2,963	5	0	3,117	3,122	6	3	3,298	3,307	9	14	3,469	3,492
-Livestock & Fishery	0	0	434	434	4	6	792	802	5	6	783	794	13	9	813	835	9	8	845	863	12	9	888	909
-Forestry	40	0	186	226	75	3	158	236	90	4	178	272	77	9	176	262	85	10	183	278	103	11	204	318
-Mining	2	0	104	106	100	2	18	120	98	2	17	117	100	1	19	120	116	5	18	139	153	5	21	179
-Processing & Manufacturing	234	6	578	818	355	35	665	1,055	541	21	537	1,099	620	36	545	1,201	735	41	508	1,284	803	45	534	1,382
-Power	36	-	-	36	89	-	-	89	89	-	-	89	97	-	-	97	107	-	-	107	117	-	-	117
-Construction	78	-	73	151	103	-	84	187	106	-	86	192	111	-	89	200	128	-	89	217	151	-	88	239
-Sub-total	390	5	3,403	3,799	730	46	4,236	5,512	934	33	4,559	5,526	1,023	55	4,759	5,837	1,186	67	4,942	6,195	1,348	84	5,204	6,636
2. Services																								
-Transportation	141	-	308	449	214	6	334	554	215	*	350	573	216	13	357	586	205	26	356	587	244	26	363	633
-Communications	26	-	-	26	38	-	-	38	40	-	-	40	40	-	-	40	48	-	-	48	43	-	-	43
-Financial Institutions	38	-	50	88	182	2	-	184	215	2	-	217	143	3	-	146	210	4	-	214	204	5	-	209
-Social & Administrative Services	575	-	-	575	1,038	-	-	1,038	1,147	-	-	1,147	1,233	-	-	1,233	1,318	-	-	1,318	1,461	-	-	1,461
-Rentals and Other Services	3	.2	571	576	74	14	734	822	76	16	748	840	77	17	765	859	82	20	776	878	87	23	792	902
-Sub-total	783	2	929	1,714	1,546	22	1,068	2,636	1,693	26	1,098	2,817	1,709	33	1,122	2,864	1,863	50	1,132	3,045	2,039	54	1,155	3,248
3. Trade	763	43	1,480	2,286	760	153	1,752	2,664	1,070	118	1,572	2,760	1,135	176	1,552	2,863	1,187	252	1,565	3,004	1,289	293	1,568	3,150
4. Total Net Output	1,936	51	5,812	7,799	3,036	229	7,556	10,812	3,697	177	7,229	11,103	3,867	264	7,433	11,564	4,236	369	7,639	12,244	4,676	431	7,927	13,034
(%)	24.8	0.7	74.5	100.0	28.1	2.0	69.9	100.0	33.3	1.6	65.1	100.0	33.4	2.3	64.3	100.0	34.6	3.0	62.4	100.0	35.9	3.3	60.8	100.0

Note: 1/ Provisional Actual, 2/ Provisional, Co-op: Co-operative

Source: Report to the Pyithu Hluttaw 1977/78, 1978/79

production. The paddy procurement price was raised significantly in 1974 which helped stimulated production. Since then, however, the price has not been increased further in spite of inflation. On the other hand, the relatively sharp upturns in the production of cereals (other than rice), horticultural produce and spices during the period under review appear to have been associated with the substantial raising of procurement prices for beans and pulses, tobacco and sugarcane in 1976 and the freeing of wheat and spice prices.

Forestry output was constrained by limited extraction and transportation capacity in consequence of shortages of spare parts and equipment particularly in 1975/76. Without the increases which took place in the production of hardwood by the private sector, the growth of the sector would have been significantly less. In mining, the only source of growth was on-shore crude oil production which jumped by 21 percent in 1976/77 permitting self sufficiency to be attained. Other minerals, which account for more than one third of mineral production, of which tin and tungsten are the most important increased marginally.

Growing from a small base, value added by the processing and manufacturing sector expanded by 7.0 percent per annum to increase its share in GDP from 9.8 percent in 1973/74 to 10 percent in 1977/78. The increased supplies of raw material from the primary sectors in combination with enlarged imports of intermediate and capital goods afforded the opportunity for this expansion. Equally important, the introduction in 1975 of the commercial guidelines provided the SEEs with improved production incentives and greater management autonomy at the unit level. This had the effect of placing Burma in a better position than it has been in the last decade to capitalize upon the many opportunities open to it for raw material-based industrial development. The impact of the guidelines on industrial relations was significant. In contrast with the situation in 1974/75, when there was much labor unrest, industrial relations appear to have

considerably improved in the last two years.

As noted previously, one of the most pressing constraints on greater utilization of capacity throughout the economy was the severe shortage of intermediate goods, spare parts and capital equipment. The transport sector was especially affected by such shortages which brought about severe under-utilization of existing capacity. Its value added grew by 3.4 percent per annum during the five year period under review. Resulting transportation bottlenecks in turn constrained overall econonmic development by restricting the marketing and distribution of essential input supplies and final products. In agriculture, transportation bottlenecks affected the distribution of even the limited supply of fertilizer and diesel fuel for pump irrigation. In forestry, lack of transport facilities constrained extraction, while several hundred thousand tons of teak and hardwood piled up at river depots, mills and the port awaiting transportation. In mining, some oil wells had to be temporarily closed, curtailing production to levels below the current annual potential of 11 million barrels.

Value added by the construction sector increased by 6.3 percent per annum. In contrast to developments in the rest of the economy, the Government services sector, in particular general administration, expanded by about 8.9 percent per annum. Value added by wholesale - and retail trade expanded inline with GDP growth. Such growth in Government services will not be fiscally sustainable unless the tax base is enlarged through expansion of primary and secondary production.

As shown in Table K-1-9, the growth of the GDP permitted total consumption to increase by 4.3 percent per annum in real terms from 1973/74 to 1976/77. In contrast, gross fixed capital formation is estimated by the authorities to have increased by 16.2 percent in 1975/76 and 12.6 percent in 1976/77 after having stagnated in

TABLE K-1-9   EXPENDITURE ON GROSS NATIONAL PRODUCTS
(1969/70 Constant Price)

(Unit: Kyats million)

	1964/65	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1/ Growth Rate 64/65-76/77 (%)
Comsumption	7,926	9,026	9,308	9,494	9,548	9,634	9,855	10,447	10,927	2.7
Gross Fixed Investment	961	1,153	1,019	1,091	895	773	779	905	1,019	0.5
Changes in Stocks	616	158	201	132	32	236	321	303	237	-
Exports	1,105	535	650	681	557	500	511	438	692	-3.8
Imports	1,554	896	790	757	494	331	378	473	554	-8.2
Gross Domestic Product	9,054	9,976	10,388	10,641	10,538	10,812	11,088	11,620	12,321	2.6
Net Factor Payments	4	2	-10	-24	-14	-20	-31	-59	-56	-
Gross National Products	9,058	9,978	10,378	10,617	10,524	10,792	11,057	11,561	12,265	2.6
Population (in millions)	24.7	27.0	27.6	28.3	28.9	29.5	30.2	30.8	31.5	2.0
GNP per Capita (Ks)	367	370	376	375	364	365	381	375	389	0.5
Investment per Capita (Ks)	39	43	37	39	31	26	26	29	32	1.6

Note: 1/ Provisional

Source: Ministry of Planning and Finance

1974/75, giving an average annual growth rate of almost 10 percent. Expenditure trends at current prices are given in Table K-1-10.

A rough calculation suggests that domestic savings in current price rose from 8 percent of GNP in 1973/74 to about 9 percent in 1976/77, implying a marginal savings rate of about 10 percent, as shown in Table K-1-11. The improved budgetary position of the Government was a major factor facilitating this savings effort. While current expenditures of the Union Government (including local authorities) were maintained at about 14 percent of GNP, entailing a continued salary freeze, the ratio of current revenue to GNP was increased from about 10 percent in 1973/74 to 13 percent in 1976/77 and the contributions of the SEEs to general revenue raised substantially. As a result, the investible surpluses of the Government grew signigicantly, reversing the long-term deterioration in the budgetary position. The overall improvement in the savings rate was also helped by the introduction in 1976/77 of a compulsory life insurance scheme for all public sector employees and a third party insurance scheme.

Table K-1-12 indicates the balance of payment from 1972/73 to 1977/78.

I.3   Selected Sectoral Performance

1)   Agriculture

Real growth in the agricultural sector increased to an average of 5 percent in 1976/77 and 1977/78 in response to more favorable weather conditions and higher procurement prices. This contrasts with the performance of the previous decade, when value added rose by only 1.2 percent per annum and production of paddy, the main crop, was stagnant. Some 433,000 acres of paddyland in Lower Burma were abandoned between 1964 and 1974, as a result of inadequate pricing policies and the failure to maintain flood control and

TABLE K-1-10 EXPENDITURE ON GROSS NATIONAL PRODUCTS
(at current prices)

(Unit: Kyat million) 1/

	1964/65	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77
Consumption	6,650	9,168	9,474	9,712	10,493	12,847	17,700	21,510	24,432
Gross Fixed Investment	807	1,160	1,056	1,184	1,111	1,146	1,267	1,868	2,305
Change in Stock	+616	+294	+175	+133	+155	+352	+475	+597	+430
Exports	1,105	535	584	664	680	930	899	1,164	1,426
Imports	1,554	897	852	921	704	575	1,016	1,620	1,820
Gross Domestic Product	7,624	10,260	10,437	10,772	11,735	14,700	19,325	23,519	26,773
Net Factor Payment Abroad	4	2	-10	-24	-16	-26	-41	-77	-73
Gross National Product	7,628	10,262	10,427	10,748	11,719	14,674	19,284	23,442	26,700
Population (millions)	24.7	27.0	27.6	28.3	28.9	29.5	30.2	30.8	31.5
GNP Per Capita (Kyat)	308	380	378	380	406	497	639	761	848
Investment Per Capita (Kyat)	33	43	38	42	38	39	42	61	73

Note: 1/ Provisional

Source: Ministry of Planning and Finance.

TABLE K-1-11   RATIOS OF INVESTMENT, SAVING AND FOREIGN CAPITAL TO GNP
(at current prices)

	1964/65	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77 1/
Gross National Product (Kyats million)	7,628	10,262	10,427	10,748	11,719	14,674	19,284	23,442	26,700
Gross Fixed Capital Formation (Kyat million)	807	1,160	1,056	1,184	1,111	1,146	1,267	1,868	2,305
GFCF as % of GNP	10.6	11.3	10.1	11.0	9.5	7.8	6.5	8.0	8.6
Gross Capital Formation	1,423	1,453	1,231	1,317	1,267	1,498	1,742	2,465	2,735
GCF as % of GNP	18.6	14.2	11.8	12.3	10.8	10.2	9.0	10.5	10.2
Foreign Capital Inflow (Kyat million)	445	451	358	346	480	290	457	319	452
Foreign Capital Inflow % of GNP	5.8	1.7	3.4	3.2	4.1	2.0	2.4	1.4	1.7
Domestic Savings	978	1,002	873	971	787	1,208	1,285	2,146	2,283
Domestic Savings as % of GNP	12.8	9.7	8.3	9.0	6.7	8.2	6.7	9.2	8.6
Domestic Savings as % of GCF	68.7	70.0	70.9	73.7	62.1	80.6	73.8	87.1	83.5

Note: 1/ Provisional

Source: Ministry of Planning and Finance.

TABLE K-1-12   BALANCE OF PAYMENT

(Unit: Kyat lakh)

	1972/73 Receipts	1972/73 Payments	1974/75 Receipts	1974/75 Payments	1975/76 [1] Receipts	1975/76 [1] Payments	1976/77 [2] Receipts	1976/77 [2] Payments	1977/78 [3] Receipts	1977/78 [3] Payments
1. Main Accounts										
- Merchandise	7,206	8,884	9,127	14,292	11,587	13,579	12,974	16,936	18,106	30,530
- Transportation and Insurance	178	757	241	804	300	1,004	332	1,023	400	1,450
- Travels	139	44	162	56	153	70	320	140	250	160
- Embassies & International Organizations	111	195	119	261	141	365	162	576	120	400
- Government Transfer	-	54	38	115	-	155	-	114	-	250
- Private Transfer	50	-	58	5	89	9	188	9	150	10
- Interest	44	423	372	776	633	1,167	293	1,026	400	1,378
- Miscellaneous	455	176	2,219	375	424	330	1,010	88	700	250
- Sub-total	8,183	10,533	12,336	16,684	13,327	16,679	15,779	19,912	20,126	34,428
2. Contribution	1,029	-	1,175	-	1,660	-	2,156	-	1,551	66
3. Loans and Interests										
- Loans	3,588	-	4,126	-	2,560	-	5,833	-	12,149	-
- Requirement of Principal	-	1,219	-	1,215	-	1,486	-	2,639	-	1,837
- Sub-total	3,588	1,219	4,126	1,215	2,560	1,486	5,833	2,639	12,149	1,837
4. Subscription/Investment Account	-	34	-	34	-	45	-	48	-	55
5. Total (1+2+3+4)	12,800	11,786	17,637	17,933	17,547	18,210	23,268	22,599	33,826	36,386
6. Financial Account										
- Short-term Loans	2,569	2,598	5,351	3,653	5,591	6,766	5,912	7,172	1,700	3,000
- I.B.E.C.	-	-	-	-	-	-	-	-	583	583
- I.M.F.										
Drawings	785	-	852	-	737	-	-	-	2,979	-
Drawing rights (S.D.R.)	-	-	60	60	-	-	-	-	531	-
Repayments	-	694	-	641	-	155	-	348	-	876
- Sub-total	3,374	3,292	6,263	4,354	6,328	6,921	5,912	7,520	5,793	4,459
7. Miscellaneous	-	32	3,152	-	-	593	-	404	-	-
8. Total (5+6+7)	16,174	15,110	27,052	22,287	23,875	25,724	29,180	30,523	39,619	40,845
9. Surplus (+)/Deficit (-)	-	(+)1,054	-	(+)4,765	-	(-)1,849	-	(-)1,343	-	(-)1,226
10. Foreign Exchange Reserves	-	4,525	-	10,782	-	8,933	-	7,590	-	6,364

Note: [1] Actual, [2] Provisional Actual, [3] Provisional

Source: Report to the Pyithu Hluttaw, 1978/79

drainage structure. Rice exports fell from almost 2 million tons in the early 60's to a low of 200,000 tons in 1974/75 before recovering to 650,000 in 1976/77. Exports of other crops such as pulses and jute experienced similar declines.

Net area sown has remained unchanged at around 19.7 million acres between 1973/74 and 1977/78. Gross area sown increased gradually from 23.3 to 23.6 million acres over that period, reflecting a slightly higher cropping intensity (117 percent in 1973/74 and 118 percent in 1977/78). Area under irrigation increased by 1.6 percent a year and still represents only 12 percent of the net sown area. Due to lack of water reflecting limited storage facilities, only 14 percent of the irrigated land is double cropped.

Due to lack of maintenance of water control structures in Lower Burma, the sown area of paddy in this region fell by 433,000 acres from 1964 to 1974. Compared to the pre-war period, area under paddy has declined by about 1 million acres. The concentration of investment resources on irrigation projects in Upper Burma at a time when existing facilities in Lower Burma were being neglected appears to have been an inefficient use of resources.

A systematic policy of low procurement prices for major agricultural commodities left little surplus in the hands of the farmers. They were thus given little incentive to make on-farm improvements and less able to afford capital inputs. A more plentiful supply of consumer goods, availability of equipment and adequate prices could have contributed much to increases in agricultural output. The enhanced procurement price of paddy caused the sown area to increase by 500,000 acres in 1976. Helped by exceptionally favorable weather and some shift in cropping patterns, paddy production in 1977/78 is estimated to have reached 9.5 million tons, i.e., over half a million tons more than the best crop ever recorded in Burma.

The raising of government procurement prices since 1972 was a major change in policy. Procurement prices for paddy were 2.5 times higher in 1975 than in 1972. Since March 1976, procurement prices of industrial crops including jute, sugarcane and cotton have been revised upwards by an equivalent order of magnitude. It is now the policy of the Government to maintain price parity among the crops.

High yielding varieties (HYVs) of paddy were grown on about 2 million acres in 1977/78. It is estimated that about 4 million acres have conditions suitable for growing HYVs. Under the Third-Four Year Plan, the new HYV programme was tested on an experimental basis in one township for two years, 1976/77 and 1977/78 and then it was launched on an operational basis in 1978/79 in 23 township, covering 2.1 million acres.

Supplies of fertilizers and insecticides have neen increased substantially. Fertilizer consumption increased from about 25,000 tons annually in the early 1960s to about 130,000 tons in 1977/78. Urea fertilizer, which is locally produced in two small plants, is unnecessarily heavily subsidized and sold at about $55 per ton, at a third to a fourth of prices prevailing in the world market. The Government is planning to set up a third fertilizer plant of a capacity of 300,000 tons of urea.

The shortage of draught animals and labor during peak periods acts as a major constraint on production expansion. This is particularly true in the case of paddy land where almost 50 percent of the area is in farm units averaging over 16 acres in size. As these farms depend upon hired workers to perform over 50 percent of their work, large cash outlays are required for their cultivation. Shortage of labor was partly the result of a low procurement price policy which prevented farmers from offering wages that could complete with other activities such as inland fishing and wood collecting. Recently, however, petty trading as an alternative activity has expanded greatly.

The mechanization program launched in the 1960s under which 88 tractor stations were established to do custom hire work for farmers has failed to overcome thses constraints. A substantial portion of the tractors owned by tractor stations, cooperatives and groups of farmers have become unusable for lack of proper maintenance. In 1977/78, only 3.1 percent of the gross sown area was ploughed by tractor stations. Mechanization of agriculture in Burma should be pursued only to the extent that it is needed to support a labor-intensive strategy aimed primarily at bringing a larger labor force on to the land. Increased use of small tractors and power tillers may be desirable in certain areas where such capital inputs are essential elements of a suitable technology, e.g. where multiple cropping requires rapid sowing and harvesting.

In 1977/78 Burma has 5,932 village managers who are in close contact with peasants and are guiding them in the application of modern agricultural techniques. By this number, about 1,000 farm families or about 3,400 acres can be covered by a village manager. Since they have to perform too many administrative duties their efficiency in extension work is being impaired. A good extension service will go a long way in increasing yields using the present technology and greatly facilitate the passage to a higher degree of technology.

Production credit needs of the farmers are partly covered by an advance purchase scheme financed by the procuring agencies. Some cooperative loans for capital equipment have been available for groups of farmers. However, there have not been any institutional credit systems for supplying individual farmers with intermediate and long-term loans to help them finance the purchase of draught animals, farm machinery and implements. This has had very adverse effects on production. The land reforms redistributed large amounts of land among small tenents and landless workers who had little or no capital stock to start operating their plots. Private, although

illegal, money lending was available but at punitive rates (10 percent per month).

Details of crop production in the country are compiled in Annex C "Agriculture".

2)   Livestock and Fishery

This sector grew at 3.3 percent per annum over the last ten years, and its share to GDP did not change at about 7 percent during 1968/69 to 1977/78.

Main species of livestock to be bred are cattle, buffalos, goats, pigs, fowls and ducks, and the number of each species in 1977/78 is about 7.7 million, 1.7 million, 0.8 million, 1.9 million, 16.9 million and 3.4 million, respectively, having increased gradually over the last ten years. Annex G 'Animal Husbandry' gives the details of livestock production in the country.

Total fish production accounts for about 536,000 tons in 1977/78, of which about 393,000 tons are obtained from marine fisheries and 143,000 tons from fresh water ones. Production has been hampered by lack of equipment and infrastructures. Out of 85,500 fishing vessels, only 4,200 are mechanized. The number of coastal fishing vessels owned by the People's Pearl and Fishery Corporation has declined from 92 in 1973/74 to present 23. Most of their 17 trawlers are in various degrees of obsolescene. As a result, the State sector has had to rely increasingly on various types of sharing arrangements with private fishermen to meet its targets.

The Government's strategy is to develop inland and coastal fishery resources for domestic consumption and offshore fisheries for export. The main emphasis is rehabilitation/expansion of the fishery fleet and improvement of fishing gear and infrastructure facilities. Details of fishery products can be refferred to Annex I 'Fishery'.

3)   Forestry

Burma is estimated to have 75 percent of the world's remaining
teak reserves in addition to extensive reserves of marketable
hardwoods. The sector is a promising earner of foreign exchange in
the near term. Its annual allowable cut is estimated at 350,000
long tons (LT) of teak and about 2 million LT of marketable hardwoods.
It is estimated in 1977/78 that 330,000 LT of teak and 450,000 LT of
hardwood were produced by the state sector, well below the levels
achieved in the early seventies. The decline in production has
resulted from the lack of forest access roads, insufficient extraction
and milling equipment including spares, poor maintenance, inadequate
supplies of diesel oil for powering equipment, and restricted access
to forest areas where insurgency is a problem. As for forestry
production, Annex H 'Forestry' gives its details.

4)   Mining

Production in the mining sector improved over the low level
reached in 1973/74, but remained below the potential implied by
known deposits and plan targets. The main factor accounting for this
improvement was the increase in the production of petroleum products
which had a weight of 55.4 percent in value added in the sector.

Crude oil production reached 30,000 barrels a day in 1977/78,
compared to 23,500 in 1976/77. Burma exported a small quantity of
petroleum products, although there appears to have been a serious
diesel oil shortage. Increased production came from 22 aditional
wells mainly in the recently discovered Lepando reserves. Some wells
in the Mann reserve were closed down temporarily, due to transport
difficulties.

Minor production increases were recorded for other major
minerals, tin, tungsten, lead, copper and silver. Exports of thses
products were well below production increases, largely due to

transport difficulties as well as smuggling. In addition, shortages
of skilled manpower, spare parts and technical problems of converting
low concentrate ores to marketable quality continued to slow down
production.

5)   Processing and Manufacturing

Accounting for about 10 percent of GDP in 1977/78, the process-
ing and manufacturing sector comprises some 37,000 factories of w
which 60 percent consist of food and textiles and clothing enterprises.
The sector together contributes some 70 percent of gross manufactur-
ing output. Other light industries include enterprises producing
wood and cork products, furniture, pharmaceuticals, simple chemicals
and electrical home appliances. Total employment in manufacturing
is estimated to be about 900,000 people. About 93 percent of the
country's industrial establishments are small enterprises employ-
ing less than 10 persons. There are only 490 factories employing
more than 100 persons. Table K-1-13 and K-1-14 show the value of
production of this sector and the operation ratio of major
manufacturings.

6)   Power

In 1977/78, Burma's total installed capacity accouts for
448,000 KW consisting of hydropower 180,500 KW, thermal power
84,000 KW, gas power 103,500 KW and diesel power 80,000KW.
Electric Power Corporation occupies 87 percent of the total install-
ed capacity. While the total electricity generated in 1977/78 was
estimated at 890 MWH, about 213 MWH was lost in various stages.
Electrified towns and villages account for 260 and 709 in 1977/78,
respectively.

7)   Construction

The construction works performed in 1977/78 was estimated at
about one billion Kyats of which 70 percent was achieved by the
state sector. The main component of construction works made by the

TABLE K-1-13 VALUE OF PRODUCTION IN PROCESSING & MANUFACTURING SECTOR
(at current prices)

(Unit: Kyat million)

	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77 [1]	1977/78 [2]
Flood & Beverages	3,200	3,334	3,343	3,285	3,685	5,049	6,069	8,272	8,919	9,716
Clothing & Wearing Apparels	778	675	686	553	661	486	547	923	1,394	1,507
Construction Materials	332	382	364	378	338	335	365	383	492	658
Personal Goods	135	154	162	156	152	155	241	379	492	524
Household Goods	18	25	27	20	21	20	30	41	53	78
Printing & Publishing	65	59	46	48	69	73	77	125	155	181
Industrial Raw Materials	169	193	207	255	256	290	361	450	641	771
Minerals	307	362	359	403	395	478	754	765	980	1,120
Agricultural Equipment	16	15	15	14	21	46	27	40	77	142
Industrial Equipment	7	5	3	8	3	5	6	2	2	17
Transport Vehicles	84	90	113	107	114	91	100	129	211	330
Electrical Goods	28	28	32	32	32	52	53	66	104	153
Miscellaneous	89	87	114	122	134	148	193	271	319	383
Total	5,228	5,409	5,471	5,381	5,881	7,228	8,823	11,846	13,839	15,580

Note: 1/ Provisional Actual, 2/ Provisional

Source: Report to the Pyithu Hluttaw 1978/79

TABLE K-1-14 OPERATION RATIO OF MAJOR MANUFACTURINGS

(Unit: %)

Commodity	No. of Shift	1973/74	1974/75	1975/76	1976/77	1977/78 [1]
Sugar	3	38.9	23.3	53.3	44.9	45.3
Tobacco	1	55.7	58.8	87.3	101.7	101.7
Ice	1	36.9	36.3	48.0	41.3	43.9
Fibre	2	43.5	37.7	75.6	92.8	90.0
Paper	-	74.8	88.0	95.8	102.1	103.0
Fertilizer	3	86.0	94.0	98.0	98.8	100.0
Refineries	3	72.0	68.0	82.0	95.0	89.6
Cement	3	63.0	84.2	85.0	81.3	79.2
Brick	2	36.6	46.0	96.9	112.0	98.5
Glass	3	77.4	59.0	60.0	82.5	82.5
Lumber	1	56.3	52.5	51.3	48.5	79.5
Match	1	60.5	76.0	93.5	60.8	60.8
Iron	2	46.1	44.0	64.9	95.7	98.3
Alminium, Enamel	1	33.1	29.5	43.1	62.3	56.6
Umbrella	1	33.3	32.7	30.7	46.0	66.7

Note: 1/ Targeted Figures

Source: Ministry of Industry

state sector is construction of industrial buildings, workshop
schools, hospitals, offices and residential buildings followed by
renovation and improvement works of road and bridges, and then
irrigation works.

8)   Transport and Communication

Burma's transportation is composed of road, railway, navigation
and airway. The toatl length of main roads including Union highways
is 13,948 miles of which 5,978 miles have been newly constructed
over the past ten years. The length of railway network is 2,701
miles in 1977/78. The total lengrh of navigable rivers is about
5,000 miles at high water and the Irrawaddy and the Chindwin are
navigable for over 2,200 miles and 700 miles, respectively. In
1977/78, there are one internationl airport in Rangoon and 42 numbers
of airfield in the country. The progress of state transport services
in the transportation sector is shown as follows;

INDEX OF STATE INTERNAL TRANSPORT SERVICES

Item	1969/70	1977/78
Rail	100	119.4
Road	100	103.2
Inland Water	100	57.9
Air	100	164.9

In 1977/78, there were 1,101 numbers of post office, 32,880
numbers of telephone, 287 numbers of telegraph office and 44 numbers
of telex.

I.4   Foreign Trade

1)   Exports

Burma's exports, which accounted for 14.1 percent of GDP in
1964/65, decreased to a share of only 4.8 percent in 1974/75, and

gained slightly to 6.4 percent in 1976/77. With the recovery of agricultural production in 1975, total export earnings increased from Ks 925.8 million in 1974/75 to Ks 1,322.6 million in 1975/76 and to Ks 1,715.7 million in 1976/77, with an average increase of 36 percent per annum.

In 1976/77, agricultural products occupied 52 percent of the total export earnings followed by forest products of 22 percent.

The volume of rice exports, the Burma's most important export earning item, declined from 1.8 million tons in 1961/62 to 262,000 tons in 1972/73 and to 192,000 tons in 1974/75, but increased to about 660,000 tons in 1977/78. The share of rice in total export earnings decreased from over 60 percent achieved in the early 1960s to the lowest level of 17 percent in 1972/73, but increased to 50 percent in 1977/78.

Exports of forest products, of which teak shares more than 95 percent, is the Burma's second most important export item, occupying 22 percent of the total export earnings in 1976/77. The quantity of teak exports decreased from 139,000 in 1972/73 to slightly over 100,000 tons annually in 1974/75 and 1975/76, and further to 84,000 tons in 1977/78. However, export earnings of teak increased from Ks 192.9 million in 1972/73 to Ks 388.6 million in 1977/78.

2)   Imports

The value of imports in real terms in the mid-1970s was about one half that of the mid-1960s, largely due to the Government import policy which allows her imports as much as the foreign exchange reserves are available. The share of imports in GDP decreased from 18.2 percent in 1964/65 to 5.6 percent in 1976/77 and to 7.2 percent in 1977/78. Reflecting the Government's emphasis on industrialization, imports of capital goods and intermediate goods grew sharply at 45 percent and 36 percent per annum during 1973/74 to 1976/77.

Previously, the Government decided her import programmes according to the availability of foreign exchange, taking into consideration short-term forecasts of export earnings. It was, however, recognized that the low level of imports had been an significant factor for the stagnation of the economy, and the Government recently decided on a more liberal import policy to support the new development strategy. Increased imports of capital goods, raw materials and spare parts to be required for relief of the existing bottlenecks, were ·allowed especially in the Key State economic enterprises and in the transport sector.

In this context, the value of imports increased sharply from Ks 574.9 million in 1973/74 to Ks 1521.1 million in 1976/77. Out of the total value of imports in 1976/77, the capital good, occupy 44 percent, the intermediate goods 46 percent and the consumer goods 9 percent.

I.5   Foreign Aid and Assistance

Burma has obtained an increasing volume of external technical and capital assistance in recent years. Prior to 1972, external assistance averaged US$50 to US$60 million per annum, comprised, in the main, of grants from Japan as war reparations. Since 1972, external grant aid averaged US$25 million per annum, while loan commitments averaged close to US$100 million, the principal sources being Japan, the Federal Republic of Germany, the World Bank and the Asian Development Bank. With the singing of a large commodity loan in 1972, disbursements from the People's Republic of China also resumed. Recently, the OPEC Special Fund has emerged as a further source of assistance for Burma's development programs.

Burma has also made use of the International Monetary Fund's resources on several occassions. Since 1974, SDR 39 million has been purchased under the Compensatory Financing Facility and SDR 24 million under a standby arrangement agreed upon in November 1974.

As of March 1977 net drawings amounted to SDR 49.5 million. During April 1977, Burma negotiated a drawing of SDR 35 million under a standby arrangement which if fully utilized would extend its use of Fund credit to the third credit tranche. In addition, Burma has received SDR 20.8 million from the Special Drawing Rights accounts and is eligible for a loan of about SDR 10 million from the Trust Fund.

At the request of the Government of Burma, the Burma Aid Group was formed in 1976 and held its first meeting in November 1976 in Tokyo, testifying to the interest of the authorities in using external cooperation in the promotion of the country's economic development. The meeting, convened under the chairmanchip of the World Bank, was attended by representatives from the Governments of Australia, Canada, France, Federal Republic of Germany, Japan, United Kingdom, and the United States. The International Monetary Fund, Asian Development Bank, and UNDP also participated. A second meeting of the Burma Aid Group was scheduled for December 1977.

The volume of aid disbursements during the first three years of the Second Four Year Plan amounted to about 33 percent of total fixed investment. Together with technical assistance, they comprised, in the main, support for the reclamation and protection of paddyland in Lower Burma (IDA); irrigation works (ADB and IDA); livestock and fisheries development (Japan, ADB and IDA); forestry extraction and transport equipment and sawmill rehabilitation (ADB and IDA); mineral exploration and production including petroleum (Canada, Germany, Japan, UNDP and IDA); development of the rice processing; jute milling, ceramic and sheet glass industries (Germany, Japan and ADB) and rehabilitation and expansion of the country's rail, seaport, inland waterways and pipeline systems (Japan and IDA), and water supply and power networks (Japan and ADB). In addition three general commodity loans were provided by Japan amounting to Yen 22 billion. Overall, the composition of the external assistance provided reflected the priorities of the Second Four-Year Plan.

II. ECONOMIC DEVELOPMENT PLAN

II-1. Twenty-Year Plan

The Twenty-Year Plan has been formulated and authorized by the second congress of the Burma Socialist Programme Party which was held in October, 1973.

1) Main Reasons for Drawing Up the Plan

There are three main reasons for drawing up the Twenty-Year Plan and they are as follows:

(a) To define clearly the long-term objective of the Burma Socialist Programme Party.

(b) To define the action to be taken to achieve the above objective, the priorities, ideology, economic strategy and techniques and economic policies.

(c) To provide a framework for the four-year plans.

2) Plan Period

The base year of the Twenty-Year Plan is the year 1973-74 while the plan period is from 1974-75 to 1993-94.

3) Objectives

The main objective is that by the year 1993-94 in the last year of the plan, The Socialist Republic of the Union of Burma shall have laid down the economic, social and political foundations. By the end of the plan-period, there shall emerge a material and technical foundations of socialist superstructure; a socialist production relationship in the socialist economy, socialist ways of thought and idea, administration, education and so on. The objectives in detail are as follows:

(a) <u>Economic Growth</u>. To double the standard of living of all
    nationalities of the Union and to fulfill to the maximum
    extent food, clothing, shelter and social needs of all the
    people. Therefore, compared with the base year 1973-74 of
    the Twenty-Year Plan, the target average net output per
    capita in 1993-94 is to be double and the target average
    consumption per capita in 1993-94 is to be 1.64 times
    higher. In order to achieve the above objective, the net
    output during the Twenty-Year Plan will have to increase
    by 3.15 times or 5.9% annually. Important planned targets
    of the Twenty-Year Plan are shown in Table K-2-1. The
    sectoral economic growth targets and the net output growth
    rate targets are shown in Table K-2-2 and Table K-2-3,
    respectively.

(b) <u>Economic Structure</u>. To transform smoothly and by planning
    the Burmese economic structure from an agricultural country
    to an agriculture-based industrial country in accordance
    with the law of balanced plan in the national economy. The
    target of structural changes in the Burmese economy in the
    Twenty-Year Plan period is shown in Table K-2-4.

(c) <u>Socialist Production Relationship</u>. To create smooth
    socialist production relationship in the Socialist Republic
    of the Union of Burma. The sectoral changes in ownership
    during the Twenty-Year Plan period is targeted in Table
    K-2-5.

(d) <u>Productivity</u>. To achieve a two percent annual productivity
    growth in accordance with the law of uniform growth in
    labour productivity.

TABLE K-2-1   PLANED TARGETS OF THE TWENTY-YEAR PLAN

Particular	Expected Growth in 1993/94 (Index. 1973/74 = 100)	Annual Growth Rate (%)
Population	158	2.3
Net Output (G.D.P.)	315	5.9
Consumption	258	4.8
Investment	620	9.6
Value of Imports	486	8.2
Value of Exports	790	10.9
Average Net Output per capita	200	3.5
Average Consumption per capita	164	2.5

Source: Planning Dept., Ministry of Planning and Finance

TABLE K-2-2   TARGETS OF SECTORAL ECONOMIC GROWTH

	Expected Growth in 1993/94 (Index. 1973/74 = 100)	Annual Growth Rate (%)
I. Production	347	6.4
- Agriculture	256	4.8
- Livestock and Fishery	256	4.8
- Forestry	256	.4.8
- Mining	352	6.5
- Processing & Manufacturing	607	9.4
- Power	607	9.4
- Construction	397	7.1
II. Services	304	5.7
- Transportation	425	7.5
- Communication	425	7.5
- Financial Institutions	262	4.9
- Social & Admin. Services	262	4.9
- Rentals & Other Services	262	4.9
III. Trade	262	4.9
IV. Total Net Output (G.D.P.)	315	5.9

Source: Planning Dept., MPF

TABLE K-2-3   TARGETS OF NET OUTPUT GROWTH RATE

Particulars	Annual Growth Rate (%)
Second Four-Year Plan	4.0
Third Four-Year Plan	5.0
Fourth Four-Year Plan	6.0
Fifth Four-Year Plan	7.0
Sixth Four-Year Plan	7.6
Twenty-Year Plan	5.9

Source: Planning Dept., MPF

TABLE K-2-4   TARGETS FOR STRUCTURAL CHANGES

(Unit: %)

Economic Sector	1973/74	1993/94
I. Production	51.4	56.5
– Agriculture	25.7	20.9
– Livestock and Fishery	7.8	6.3
– Forestry	2.6	2.1
– Mining	1.2	1.3
– Processing & Manufacturing	11.5	22.1
– Power	0.7	1.4
– Construction	1.9	2.4
II. Services	23.6	22.8
– Transportation	5.8	7.8
– Communication	0.3	0.4
– Financial Institutions	1.2	1.0
– Social & Administrative Services	9.2	7.7
– Rental & Other Services	7.1	5.9
III. Trade	25.0	20.7
IV. Total Net Output (G.D.P.)	100.0	100.0

Source: Planning Dept., MPF

TABLE K-2-5 TARGET FOR SECTORAL CHANGES BY OWNERSHIP

(Unit: %)

Year	Particulars	State	Co-operative	Private	Total
1973/74	Production	18	8	74	100
	Services	58	2	40	100
	Trade	48	17	35	100
	Total Net Output	35	8	57	100
1993/94	Production	39	33	28	100
	Services	67	9	24	100
	Trade	54	25	21	100
	Total Net Output	48	26	26	100

Source: Planning Dept., MPF

(e) Elimination of Unemployment. To eliminate unemployment and under-employment in the Socialist Republic of the Union of Burma in twelve years.

(f) Socialist Education System: To create a socialist education system which will be in consonance with the economy of the Socialist Republic of the Union of Burma and promote socialist mode of production.

(g) Regional Economic Growth: To achieve feasible and proportional economic growth in the States and Divisions of the Socialist Republic of the Union of Burma and to narrow the gap in the standard of living between them gradually.

(h) Reducing Disparity in Income: To reduce the disparity in income of the working people even though they will benefit according to their physical or mental ability.

(i) Socialist Accumulation of Capital: To achieve a steady growth in the accumulation of capital in the Socialist Republic of the Union of Burma according to the law of Socialist accumulation of capital.

4) Priority

In order to implement successfully the planned objectives of the Twenty-Year Plan, the following long-term priorities must be observed:

(a) To boost production in agriculture, livestock and fishery, and forestry; and to promote export.

(b) To establish consumer gooods industry based on the increased production of the agriculture, livestock and fishery and forestry sectors; and import substitution goods inudstry.

(c) To increase mineral production as much as possible and to initiate in the establishment of heavy industries using mineral products as raw materials.

5) Programme and Ideology

The programme to be followed in formulating this Twenty-Year Plan as well as in its implementation by means of five consecutive Four-Year Plans, is the Burmese Way to Socialism Programme. The guiding ideology is the ideology of correlation of man and his environment.

6) Economic Strategies and Techniques

The economic strategy of the Burma Socialist Programme Party for preparing the Twenty-Year Plan and for the implementation by means of five consecutive Four-Year Plans is to promote in the actual production growth. Techniques for this strategy are:

(a) to utilise fully the productive forces of the nation;

(b) to achieve harmonious coordination between economic structures;

(c) to raise economic efficiency; and,

(d) to minimise losses of state-owned and cooperative properties.

7) Economic Policies

The economic policies to be followed in formulating and implementing the Twenty-Year Plan are the Long-Term Economic Policies of the Burma Socialist Programme Party adopted at the Fourth Central Committee Meeting. The detailed formulating and drawing up of the short-term economic policies are to be done within the framework of the Long-Term Economic Policies.

8) Implementation Programme

The People's Assembly of the Socialist Republic of the Union of
Burma is to implement this Twenty-Year Plan by means of five con-
secutive FOUR-YEAR PLANS. In this Twenty-Year Plan, the ratio of
production, consumption, investment and economic ratios of different
sectors, have been prescribed. Economic ratios within individual
sectors must be determined in detail by the Ministry concerned in
consultation with other related departments and regions. In formu-
lating and implementing long-term and short-term plans, the system
of centralization will be practised at the central level but will be
relaxed at the project level. The ministries concerned must there-
fore formulate and implement plans for their respective economic
sectors.

II-2. Four-Year Plan

As stated in the previous chapter, the five consecutive Four-
Year Plans have been formulated under the Twenty-Year Plan, being
started by the Second Four-Year Plan in 1974/75.

1) Second Four-Year Plan

a) Directives of the Second Four-Year Plan

- Plan Period

The plan period of the Second Four-Year Plan is
from 1974/75 to 1977/78.

- Objectives

In formulating and implementing the Second Four-Year
Plan, the following objectives are to be observed:

(a) To restore export value level to pre-1964-65
level.

(b) To make maximum use of the productive forces of the nation.

(c) To achieve steady growth in economic efficiency and labour productivity in the State and Cooperative enterprises.

(d) To minimise losses of State and Cooperative properties.

- Economic Targets

The following are to be set as economic targets in formulating the Second Four-Year Plan:

(a) To achieve four percent annual growth in Net Output (G.D.P).

(b) To strive for a minimum of K.100 crore export trade.

(c) To create a capital investment of over K.160 crores.

(d) To raise the labour productivity growth by two percent annually in State and Cooperative enterprises.

(e) To reorganise State and Cooperative enterprises on commercial basis; to appoint the right place and to practise the system of reward and punishment.

- Sectoral Targets

In the formulation of the Second Four-Year Plan, the minimum sectoral targets set are shown in the succeeding page.

Economic Sector	Annual Growth Rate (%)
Production	4.3
Agriculture, Livestock & Fishery, Forestry	3.4
Mining	4.3
Processing and Manufacturing, and Power	6.9
Construction	4.8
Services	3.9
Transportation and Communication	5.2
Trade and Other Services	3.5
Net Output (G.D.P)	4.0

- Sectoral Priorities

    The following order of priorities of each sector is to
    be set in formulating and implementing the Second Four-
    Year Plan:

    1) Agriculture
    2) Forestry
    3) Mining
    4) Transport and Communications
    5) Livestock and Fishery
    6) Power
    7) Processing and Manufacturing
    8) Construction
    9) Social Services
    10) Trade
    11) Other Services

- Formulation and Implementation

    The Ministry of Planning and Finance is to formulate
    in detail, after thorough consultations with the minis-
    tries concerned and Economic Plan Implementation

Committees, a detailed Four-Year Plan with detailed targets, order of priorities of each sector and project plans they are to be made within the framework of the Twenty-Year Plan and this directive. This Draft Second Four-Year Plan is to be submitted for confirmation to the People's Assembly in March, 1974.

The Council of Ministers and the People's Councils at all levels are to implement, by means of public administration, the Second Four-Year Plan as approved by the People's Assembly. The Party and the class and mass organizations led by the Party are to help in the implementation of the plan by organisational means.

b) Brief Performance of the Second Four-Year Plan

Implementation of Burma's Second Four-Year Plan which covered the period 1974/75 through 1977/78 had been completed in March, 1978.

Provisional data for 1977/78 indicate that the gross domestic product (GDP) in real term rose at an average annual rate of 4.8 percent during the period of the Second Four-Year Plan. Population increased from 29.5 million in 1973/74 to 32.2 million in 1977/78 at an average annual rate of 2.2 percent. Real per capita GDP, therefore, increased at an average annual rate of 2.6 percent, per capita income by 3.4 percent and per capita consumption by 2.7 percent.

As regards the structure of Economy, the productive sectors accounted for 50.9 percent, the services sectors for 24.9 percent and the trade sector for 24.2 percent of the total GDP at the end of 1977/78, the final year of the Second Four-Year Plan.

The economy which experienced some serious setback in 1974/75 recovered moderately during 1975/76 due mainly to a series of fiscal, monetary, managerial and institutional reforms and measures adopted

during the year. The economy made further progress as a result of the efforts made during the last two years of the plan period to raise the level of production and stepped-up implementation of the reforms and measures introduced in 1975/76.

One of the most significant reforms introduced in 1975/76 to curb inflation and promote production efficiency was the programme for operating the State Economic Enterprises (SEE) on commercial basis. In line with this programme, the State trading organizations were re-organized and a new distribution system under which Co-operative Societies were allowed to play a more active role in internal trade was introduced during the year. As a result, the operating efficiency and financial position of the SEE improved to some extent.

In addition, a programme for strengthening the transport system was implemented; and interest rates on the saving bank deposits were raised for more effective mobilization of domestic resources. The economy which recovered in 1975/76, started to gain momentum in 1976/77 registering a rate of growth of 5.9 percent. Implemetation of the programme and measures initiated in 1975/76 were stepped up during the year. To stimulate exports and establish a more rational price structure, the procurement prices of some agricultural exports products were revised upwards. A programme for liberalization of imports was implemented to ensure a regular flow of goods required by the SEE. To promote the production effeciency of the SEE, bonuses were disbursed to corporations based on their plan performance and fulfilment of their assigned operating ratios.

The monolithic banking system was reorganized and a new taxation system was introduced. Though public investment doubled in 1976/77, the State budget which had been in deficit over the past few years showed a modest surplus due to the increase in tax revenue and cu-rrent account surpluses of the SEE during the year. This improvement in the fiscal and monetry situation was reflected by the decline in the rate of monetary expansion which fell by 10 percent. To establish

a more rational price structure and thereby prevent undue price increases, the sale price of the SEE were revised according to a realistic and standardised costing system.

Price controls imposed on some commodities as a short-term price stabilization measure were removed in 1976/77 in order to speed up the flow of goods. As mentioned earlier, there had been a fair success in curbing the rate of monetary expansion. This, complemented by other price stabilization measures, led to a decline in the annual rate of inflation as evidenced by the consumer price index for the middle income group at Rangoon which rose by 12.7 percent only in November 1976, over the previous year.

The measures adopted during the previous years were implemented more extensively in 1977/78. Interest rates on the saving banks deposits and saving certificates were raised for the second time in 1977/78, to encourage domestic savings further. To facilitate expansion exports, foreign exchange rates were reallied.

In addition, the Trade Council, under the guidance and supervision of the Economics Co-ordination Committee of the Council of Ministers, systematically co-ordinated processing, shipping and procurement of export commodities. As a result; the export earnings for 1977/78 which amounted to K. 1,811 million showed a considerable increase over that of the preceding year although it still fell short of the plan target. The State Budget continued to show a surplus in 1977/78, while currency in circulation expanded by only 3 percent for the period ending September 1977 over the previous years. Along with the improvement in fiscal and monetary conditions, prices become more established. Consequently, consumer price index for the middle income group at Ragoon which has been rising over the past few years declined by 5 percent for the period ending November 1977 over the previous year.

Summing up, the economy which began its modest recovery in 1975/76 picked up momentum considerably during 1976/77 and 1977/78, the last two years of the plan period.

2) Third Four-Year Plan

    a) Plan Period

The Third Four-Year Plan covers the period from 1978/79 to 1981/82 and has been formulated in line with the guidelines of the Burma Socialist Programme Party.

    b) Objectives

The principal objectives of the Third Four-Year Plan are as follows:

    (1) The primary aim of the plan is to steer the economy back on to the growth path of the Twenty-Year Plan by the end of 1981/82.

    (2) To achieve this objective, the gross domestic product in real term is planned to increase at an average annual rate of 6.6 percent.

    (3) To strive for achieving a steady rate of growth in labour productivity during the plan period.

    (4) To promote the expansion of exports.

    (5) To attain the economic rate of growth mentioned above, the level of public investment is planned at an annual average of Ks. 4,140 million; and to formulate and execute programme for expansion of cooperative and private investment in line with the party guidelines.

    (6) To formulate and implement programme for achieving full utilization of the nation's manpower resources in accordance with the guiding principles of the party.

In the Third Four-Year Plan, the sectors of the national economy, namely, Agriculture, Forestry and Mining with potential for immediate development through implementation of projects with short gestation period and high rate of return on investment are to be given top priority.

Transport and Communications with also be given high priority to strengthen the transportation system and thereby ensure a smooth and regular flow of goods during the plan period.

c) National Aggregate Targets

The projections for population growth in Burma during the Third Four-Year Plan period is shown in Table K-2-6.

The targetted average annual growth rates of the productive, services and trade sectors during the Third Four-Year Plan are shown in Table K-2-8.

Planned annual rates of growth in imports, exports, consumption, investment and individual economic status are shown in Table K-2-7. Also, planned structural changes and allocation of public investment during the Third Four-Year Plan period are shown in Table.K-2-8.

The share of the Public Sector in total gross domestic product is to increase from 36.3 percent in 1977/78 to 38.7 percent by the end of 1981/82. The share of the cooperative sector in GDP is planned to increase from 3.4 percent in 1977/78 to 4.9 percent by the end of 1981/82 and the share of the Private Sector is to decline from 60.3 in 1977/78 to 56.4 percent by the end of the plan period.

d) Measures for the Plan

Measures which will be adopted for implementing the Third Four-Year Plan are as follows:

TABLE K-2-6   POPULATION PROJECTION

(Unit: thousand)

Year	Total Population	Annual Growth Rate (%)
1977/78 (Base Year)	31,859	-
1978/79	32,573	2.24
1979/80	33,313	2.27
1980/81	34,083	2.31
1981/82	34,882	2.34

Note: Estimated mid-year population

Source: Planning Dept., MPF

TABLE K-2-7   TARGETTED ANNUAL GROWTH RATES

	Average Annual Growth Rate (%)
Imports	12.7
Exports	10.8
Consumption	5.8
Investment	11.2
Individual Economic Status	
Per Capita Net Output	4.4
Average Net Output per Worker	4.1
Per Capita Income	4.6
Per Capita Consumption	3.7
Per Capita Investment	8.6

Source: Planning Dept., MPF

TABLE K-2-8 KEY INDICATORS OF THE THIRD FOUR-YEAR PLAN

	Annual Growth Rate (%)	Structural Changes Base Year (77/78)	Structural Changes Target Year (81/82)	Allocation of Public Investment Kyat million	Allocation of Public Investment Percentage
I. Production	7.7	50.6	52.7	12,804	77.3
– Agriculture	5.8	26.6	25.8	2,258	13.6
– Livestock and Fishery	5.0	6.9	6.5	1,440	8.7
– Forestry	5.8	2.4	2.3	820	5.0
– Mining	12.2	1.4	1.7	1,097	6.6
– Processing & Manufacturing	12.2	10.7	13.1	5,982	36.1
– Power	14.3	0.9	1.2	849	5.1
– Construction	11.8	1.7	2.1	358	2.2
II. Services	5.5	24.8	23.7	3,576	21.6
– Transportation	8.6	4.8	5.1	} 2,192	13.2
– Communication	12.3	0.3	0.4	}	
– Financial Institutions	9.7	1.4	1.5	25	0.2
– Social & Admin. Services	4.7	11.4	10.7	1,179	7.1
– Rental & Other Services	3.1	6.9	6.0	180	1.1
III. Trade	5.4	24.6	23.6	183	1.1
IV. Total Net Output (G.D.P.)	6.6	100.0	100.0	16,563	100.0

Source: Planning Dept., MPF

(1) To fully utilize the productive resources of the country.

(2) To speed up the programme for operating SEE on commercial basis.

(3) To accord high priority to short-term agricultural and farm development programme in implementing annual plans.

(4) To improve the productivity by increasing the existing productive forces and to procure the adequate inter-mediate and capital goods.

(5) To give high priority to implementation of new projects with high rate of return on investment and short gestation period.

(6) To take appropriate measure for creating new job opportunities.

(7) To strive for fulfilling the minimum requirement of the people for essential goods produced by the SEE.

(8) To formulate and implement programme providing rights and incentives within the framework of long and short-term policy guidelines to cooperatives and private enterprises in order to raise their production level.

(9) For the fullest possible utilization of natural resources in support of the socialist economic con-struction, investment projects may require either the capital intensity beyond the means of the State or advanced technical know-how and capital equipment. In such cases, mutually beneficial economic coopera-tion with foreign public or private enterprises will be considered for specified periods provided they are not contrary to the socialist system.

(10) To set up agro-supportive heavy industries during the plan period for the achievement of the long-term objective of establishing mineral-based heavy industries envisaged in the Twenty-Year Plan.

(11) To reduce production costs, wastages and losses to a minimum level.

(12) To further stabilize prices.

(13) To formulate and execute detailed programme in the course of implementing annual plans.

(14) To coordinate the plan formulation and implementation process both at central and basic levels in order to achieve a balanced inter-sectoral and regional development.

One of the principal objectives of the Third Four-Year Plan is to increase the gross domestic product at an average annual rate of 6.6 percent. In order to achieve this objective, total value added of the productive sectors are planned to increase by 5.8 percent for the Agriculture Sector, 5.0 percent for Livestock and Fishery Sector, 5.8 percent for Forestry Sector and 12.2 percent for the Mining Sector and 12.2 percent for the Processing and Manufacturing Sector. If the above-mentioned targets could be achieved, per capita GDP would increase by 4.3 percent, per capita income by 4.6 percent, per capita consumption by 3.6 percent, per capita investment by 8.6 percent and net output per worker by 4.0 percent compared to 1977/78.

The targetted growth rate of GDP in the annual plan 1978/79, first year of the Third Four-Year Plan, is 5.9 percent. From the experiences of the Second Four-Year Plan, efforts should be made for maximum utilisation of existing productive forces to fully achieve 1978/79 plan targets.

e) Sectoral Development Programme

- Agriculture

In accordance with the above-mentioned policy directives, the agricultural development programme of the Third Four-Year Plan emphasizes the promotion of improved methods of cultivation. These usually yield quicker returns than the extensive method. They involve technical change and consequent increase in productivity. The main element of improvement in the method of cultivation is the use of high yielding varieties of crops in selective areas under the close supervision of agricultural technicians. The programme may therefore be called an Intensive HYV programme. In other words, the greater part of increase in agricultural output is to be realised through raising the yield per acre rather than through extension of the area under cultivation. For example, in the case of paddy the Plan aims at an increase in output of about 1.7 million tons, of which about 90 percent is to be realised through the increase in yield per acre. This is shown in Table K-2-9.

The Intensive HYV programme has been adopted as the chief means of increasing the agricultural output not only because there is considerable scope for a quick increase in yield per acre but also because it involves technical changes which would become the necessary foundations for a sustained increase in agricultural productivity. In order to implement this programme successfully a new method of encouraging farmers to grow HYV was tested on an experimental basis in one township for two years and then it was launched on an operational basis in 1978-79 in 23 townships, covering 2.1 million acres.

Previously, attempts to introduce HYV had spread resources thinly over a wide area. This time the programme covers only selected areas where a sufficient number of extension servicemen are stationed to work closely with the farmers to provide technical assistance and to ensure the availability of the necessary inputs, especially chemical fertilizers. Therefore, it may also be called an integrated

approach. The results are found to be very encouraging and the response of the farmers are enthusiastic.

The Intensive HYV programme will be expanded gradually and its ultimate objectives are to put about 60 percent of paddy area under HYV and to achieve an average yield of about 2,800 pounds per acre. When these objectives are achieved five main rice producing Divisions and States, namely, the Irrawaddy Division, the Pegu Division, the Rangoon Division and the Arakan and Mon States, will produce about eight million tons of paddy annually. This will provide the necessary surplus for export as well as meet a great part of the requirement for domestic consumption. The other parts of the country would thus be able to reduce the area under paddy and produce more of other crops. It is in this way that diversification within the agricultural sector is to be carried out.

The Intensive HYV method will also be applied in the cultivation of other crops. Here again it will be applied, in the first instance, to a few crops in selected areas. In the sectoral plan for agricultural development of the Third Four-Year Plan eight other crops have been selected to be put under the Intensive HYV cultivation method. These crops are maize, sugar cane, groundnut, jute, long staple cotton, butter bean, gram and matpe. Table K-2-10 shows the output targets of these crops and that of paddy.

The Intensive HYV programme has to be expanded gradually because of two main constraints. Firstly, there is the question of the supply of chemical fertilizer and secondly there is the problem of water control. According to the sectoral plan, urea fertilizer requirement is estimated to rise from 180,000 tons in the first year to 280,000 tons in the last year of the Third Four-Year Plan. But during the first three years of the plan domestic production of urea is estimated at 130,000 tons per year and the new urea plant is expected to come into operation only in 1981-82, when domestic production will increase to 280,000 tons. Thus, in the first three

TABLE K-2-9   TARGETS OF PADDY OUTPUT

Particulars	1977-78 (Base Year)	1981-82 (Targets)
1. Sown acreage (000 acres)	12,849	13,077
2. High yield varieties (000 acres)	1,180	2,895
3. (2) as % of (1)	9%	22%
4. Total output (000 tons)	9,378	11,043
5. Yield per acre (lbs.)	1,634	1,891
6. Planned increase in output (000 tons)	...	1,665
7. Increase in output due to increase in area at 1977-78 yield (000 tons)	...	166
8. (7) as % of (6)	...	10%

Source: Planning Dept., MPF

TABLE K-2-10   OUTPUT TARGETS OF SELECTED CROPS

(Unit: 1,000 tons)

Crops	1977-78 (Base Year)	1981-82 (Targets)	Average annual growth rate (%)
1. Paddy	9,378	11,043	4.2
2. Maize	99	154	11.7
3. Sugarcane	1,986	3,056	11.4
4. Groundnut	543	675	5.6
5. Jute	93	123	7.2
6. Long Staple Cotton	37	64	14.7
7. Butter Bean	42	65	11.5
8. Gram	88	129	10.0
9. Matpe	37	54	9.9

Source: Planning Dept., MPF

years of the Third Four Year Plan, the average annual deficit of urea fertilizer will be about 80,000 tons. In addition, 50,000 tons of triple super phosphate fertilizer and 10,000 ton of potash will have to be imported annually. During 1978-79, the first year of Third Four Year-Plan, total chemical fertilizer import was 98,000 tons. In the remaining years, Burma requries to import more than 100,000 tons of chemical fertilizer annually, for which Burma needs more commodity loans and grants.

Even if the problem of fertilizer shortage could be solved it is necessary to expand water control facilities in order to grow HYV successfully. It is expected that three major irrigation projects, the North Nawin, Mobye and Ho Pong Valley reservoirs, would be completed during the Third Four-Year Plan and two others, Sedawgyi and Hyaunggyat irrigation projects will be in the course of various stages of implementation. In addition, two major flood control projects, Lower Burma Paddyland Development Project I for protection from sea water inundation and floods and the Chindwin River Flood Protection project will be completed. Two new projects, Lower Burma Paddyland Development Project II and Arakan Flood Protection Project, will be undertaken during the Plan period.

In addition to these major projects, there are minor irrigation and land reclamation projects which will bring abandoned and fallow land under cultivation again. There are hundreds of acres of abandoned and fallow land scattered in the various parts of the country, espeically in the Arakan State, along the foothills of Pegu Yoma and the banks of the Chindwin River. The projects for land reclamation are to be implemented both by the Government and farmers, on communal or individual basis. The Government will provide the necessary financial assistance to the farmers, who will also be given such incentives as non-nationalisation guarantee and exemption from payment of land revenue and income-tax under the Private Enterprise Law.

In Burma, cattle power is still the chief source of traction power in agricultural production. In 1977-78, about 92 percent of the total cropped area was ploughed with cattle, each pair ploughed seven and a half acres on the average. That is regarded as the maximum workload that a pair of cattle should be made to work. Therefore, it is necessary to increase the number of cattle along with increased cropped area. The Third Four-Year Plan envisages an increase of about 536,000 heads of cattle, an increase of about 10 percent, during the Plan period. However, it will be necessary to supplement them with additional 4,600 tractors and 5,000 units of power tillers, which are becoming popular with farmers.

The livestock plan relating to cattle includes programmes to increase the number of draught animals, to take better care of existing stock and to produce better breeds of cattle. It also includes programmes to increase output of dairy products, beef, hide and skin. The entire livestock plan covers other types of animals husbandry with emphasis on mixed farming in the rural areas in order to reduce under-employment and to increase farm incomes.

Another important source of income for rural population is fishery and its importance is indicated by the fact that fishery output of the private sector accounted for about 95 percent of the total fishery output in Burma. This is one of the areas where a State Economic Enterprise is working very well with private producers. The Peoples Pearl and Fishery Corporation sells nets and other fishing gears to fishermen, who sell their fish and prawns to the Corporation. This activity is to be expanded and at the same time the Plan also envisages a fairly rapid expansion of the fishery output of the public sector. Peoples Pearl and Fishery Corporation plans to increase its export of marine fishery products from the current level of about 1,900 tons to a little over 17,000 tons by 1981-82. In support of this, the Corporation plans to increase its fleet of fishing trawlers, to establish new fishing ports and other facilities. Marine fishery research will also be developed.

- Forestry and Mining

Forestry and mining are two other important primary producing
sectors of the economy of Burma. In the past few years, the Govern-
ment of Burma was preoccupied with the transportation problem in the
forestry sector. Now that transport bottlenecks have been eased the
Third Four-Year Plan has put greater emphasis on the question of
optimum utilisation of forest resources, including conservation,
quality improvement of forest products and diversification of their
uses. In the sectoral Plan for forestry, priority is given to forest
conservation works. There are afforestation and reforestation pro-
jects and a programme to expand reserved forest area. Extraction,
production and export of timber, especially of teak,
are to be expanded within the limit of the maximum sustained yield.
Existing forestry projects financed by the World Bank and the Asian
Development Bank are to be extended to other areas with new projects.
Therefore, the annual output targets of teak rise slowly from the
current level of 300,000 tons to 400,000 tons by 1981-82. New saw
mills are to be set up both to expand the milling capacity as well
as to improve the quality of timber. Regarding the better and diver-
sified use of forest resources the Third Four-Year Plan envisages
the development of furniture industry and other wood-based indus-
tries. For example, there are varieties of woods and bamboos suitable
for making pulp and synthetic fabrics and some of these abundant re-
sources are barely touched. Therefore, there are projects such as a
viscose rayon plant and new pulp and paper mills to tap these
resources.

The mining sector of Burma has often been looked upon as a
sector producing primarily for export. This is partly because some
of the mining enterprises are well-known export producers and partly
because most of the mining projects, financed with foreign loans,
are export-oriented undertakings. However, the mining sector also
has a high degree of linkage with other sectors of the economy. It
supplies raw materials and fuel to the agriculture, industry and

transport sectors, among others. With economic development, its supporting role to other sectors assumes increasing importance. For example, the introduction of HYV crops and mechanisation of agriculture, especially the use of water pumps, have caused a sharp increase in the demand for urea fertiliser and diesel oil. Similarly, mechanisation of timber extraction and the growing number of powered vessels in the fishery industry increase the demand for diesel oil and other petroleum products. The mining sector also supplies a great variety of mineral products, such as coal, limestone, gypsum, baryte, clays and sands to industrial, construction and transport organisations.

Therefore, in the Third Four-Year Plan, top priority is given to the expansion of crude oil production, which has been allocated about 57 percent of total investment allocated to the mining sector. The increased output of crude oil and petroleum products is to meet both the growing home demand and for export. The total value of exports of minerals is targeted to increase from K 331 million to K 725 million, and its share of the total value of exports is to increase by about four percentage points during the Third Four-Year Plan.

In order to achieve the export target the gross product of the mining sector will have to rise by a little over 12 percent annually during the Plan period. It is believed that this high rate of growth will be achieved because many of the mining projects were started a few years ago and many of them have now been completed or are near completion. When completed it will solve the problem of oil storage and transport at the oil fields and therefore oil production will be accelerated. Similarly, after the initial teething troubles, the Heinda Mines Project has been able to begin production in 1979 and therefore, it will increase tin output considerably during the Plan period. The technical problem of concentration and refining of low grade ores at the Bawdwin Mines has been solved and its output is also expected to increase substantially.

However, one major problem remains to be solved. That relates to
a shortage of workers at all levels, from miners to mining engineers.
It is due to the fact that most of the mines are situated at remote
places, away from the more populous areas of the country. Measures
have been taken to improve the working conditions, to provide
attractive incentives, to ensure adequate supply of basic necessities
and to provide more amenities of life at the mines. It is hoped that
the output targets of the various minerals can be fulfilled without
much difficulty. Table K-2-11 below shows output targets of some
important minerals in the Third Four Year Plan.

The Third Four-Year Plan also includes a long-term objective
relating to the establishment of heavy industry. It lays down the
policy that preliminary work for the production of basic raw materials
for the establishment of heavy industry is to be carried out during
the Plan period. Thus, the Plan includes an iron ore project as pre-
liminary work for the establishment of an iron and steel industry in
accordance with the objective of the Long Term Plan.

- Processing and Manufacturing

The creation of the necessary foundations for the establishment
of heavy industry in accordance with the Long Term Plan is also one
of the objectives of the sectoral Plan for industry. Other objectives
are: (a) to produce raw materials to meet the need of new productive
enterprises, (b) to produce inputs required by the agricultural sector,
(c) to expand import substitution industries, (d) to promote the export
of industrial products and (e) to achieve an average annual growth
rate of 12.2 percent for the industrial sector.

In order to achieve the above-mentioned objectives measures will
be taken to strengthen the scheme for commercialisation of State Eco-
nomic Enterprises, to provide adequate raw materials and spare parts
for uninterrrupted production and for the full utilisation of
existing resources, and to prevent wastages and losses. Distribution

TABLE K-2-11   OUTPUT TARGETS OF MINERALS

Minerals	Unit	1977-78 (Base Year)	1981-82 (Targets)
1. Crude oil	US barrels (000)	10,951	17,084
2. Natural gas	Cu.ft. (million)	10,200	23,468
3. Coal	ton	30,000	38,000
4. Tin and Tungsten	ton	2,443	3,115
5. Silver	Ounces (000)	410	576
6. Refined lead	ton	5,198	7,500
7. Zinc concentrate	ton	6,000	9,000
8. Barytes	ton	17,000	60,000
9. Jade	viss	4,000	5,940
10. Gems	carat	40,000	185,640

Source: Planning Dept., MPF

and marketing facilities will be further improved so that there will
be a smooth flow of goods to the consumers. Material and other incen-
tives will be provided to workers in order to raise their productivity.
These measures will maintain stable conditions in the State Economic
Enterprises, which will thereby be able to achieve steady progress.

Furthermore, industrial production in the private sector will
be promoted in accordance with the rules and regulations of the
Private Enterprise Law. The contribution of the public, cooperative
and private sectors to gross output of the industrial sector is
indicated in the following.

(Unit: Kyat million)

Sector	1977-78		1981-82	
	Value	Percent	Value	Percent
Public sector	3,098	47.4	4,511	46.4
Cooperative sector	325	5.0	644	6.6
Private sector	3,114	47.6	4,555	47.0
Total	6,537	100.0	9,710	100.0

The investment programme of the public sector is drawn up in
conformity with the above-mentioned policy guidelines. Some of the
major projects which are expected to be completed during the Third
Four-Year Plan include rice mills, saw mills and jute mills projects,
which are intended to improve the quality of export products; oil
refinery, paper and pulp mills, solar salt plants, and a cement mill,
which aim at promoting and possibly diversifying exports: and a urea
fertilizer plant, textile mills, a sugar mill and a glass sheet
factory which are import substitution enterprises.

-- Infrastructure

Another important industrial policy relates to the location of
industry. In order to have a balanced regional development new
industries are located away from the two main cities of Rangoon

and Mandalay. In most cases therefore new infrastructure has to be created in the new industrial towns. Wherever possible, hydro-electric power is brought into the area as the chief source of energy. But there is only one major source of hydro-electricity in Burma. There will be second hydro-electric power source with the completion of the Sedawgyi Hydro-electric Project. Furthermore, small hydro-power plants will be set up in suitable areas in order to create the necessary precondition for regional development. Although a number of hydro-electric power projects are at different stages of implementation the installed capacity of hydro-electricity will remain unchanged at 168,000 kilowatts during the Third Four-Year Plan. The increase of about 22 percent in the installed capacity will be due to increase in the number of thermal power plants. The emergence of new industrial towns requires the extension of the transmission lines of the existing hydro-electric grid system. During the Plan period, 750 miles of transmission lines and 2,400 miles of distribution lines will be constructed.

Balanced regional development policy is also an important determinant of the programme for the construction of new roads in Burma. The Bassein-Monywa Road is a case in point. But there are also new road constructions to remedy the chief defect of the previous road system, in which two arteries of roads run down the two main river valleys of the country. Therefore, a number of new roads have been constructed or are under construction, running east and west, to integrate the different parts of the country more closely. Some new roads are intended to extend existing roads into the less developed parts of the country. However, it may be mentioned that in the Third Four-Year Plan investment allocated for the construction of new roads is less than that for the improvement and maintenance of old roads. For the former, the allocation is K.353 million as compared with K.542 million for the latter.

But in the sectoral plan for the transport sector road trans-
portation has been accorded only third priority, preceded by railway
and waterway transportation, although the Plan stresses the importance
of better coordination between the three types of means of transporta-
tion. Investment allocation for different means of transportation
of the public sector in the Third Four-Year Plan is shown below.

(Unit: Kyat million)

	Sub-sector	Amount	Percent
1.	Burma Railways Corporation	588	29.5
2.	Inland Water Transport Corporation	324	16.2
3.	Road Transport Corporation	173	8.9
4.	Burma Airways Corporation	64	3.2
5.	Department of Civil Aviation	94	4.7
6.	Burma Five Star Shipping Corporation	309	15.5
7.	Burma Ports Corporation	113	5.7
8.	Communication Corporation	325	16.3
	Total	1,995	100.0

One problem which receives urgent and priority attention in the
transport sector is the necessity to replace old rolling stocks,
vessels and crafts, especially coastal and ocean-going ships.
Another problem is that of management of the state transport organi-
sations. It is being solved in a number of ways. For example, an
incentive system of payments has been introduced in the Road Transport
Corporation. A policy of decentralisation has also been adopted,
permitting other state organisations than transport corporations to
own and operate fleets of vehicles and/or vessels. Thus, the
Agricultural and Farm Produce Trade Corporation and the Petroleum
Industry Corporation are allowed to have their own fleets. The
replacement of peoples shops by consumers cooperative societies also
help to mitigate the problem of transportation because the latter has
greater flexibility in the use of private transport facilities, which
are supposed to carry about 80 percent of estimated tonnage to be
transported within the country.

- Social Sector

Of equal importance, if not more, as investment in infrastructure
is investment in the social sector. Burma is well-known for its high
rate of literacy. It is high according to a certain definition, which
states that if a person can read and write a simple letter he or she
is literate. Because of the nature of the Burmese alphabet it is
possible to teach a person, especially adults, to read and write a
simple letter in a very short time, in about six months or less.
Such ability is, of course, very desirable and much preferable to
total illiteracy. But this skill is not sufficient for effective
participation in the tasks of developing an economy on the basis of
modern technology. For that purpose, if Burma takes the completion of
primary education as the minimum requirement and definite literacy
accordingly then the ratio of population above 15 years of age who
have completed primary schooling to the total population above that
age will be about 14 percent. On the other hand, if the secondary
school education is taken as the minimum requirement, the ratio will
be only 3.2 percent. This is certainly very low. Therefore, one of
the objectives of the education plan of the Third Four-Year Plan is
to take all necessary measures within the available resources, so
that secondary education will be accessible to everyone as soon as
possible.

Another objective of the education plan is to devise a basic
education system which will bring about "all round development" of
the students: intellectually, physically and morally with some basic
knowledge of vocational education so that they will be able to take
up suitable vocations when they leave school. In other words, the
main feature of the basic education system is to impart production-
oriented education.

Presently, the above principle has been extended to the level
of higher education as can be seen from the introduction of regional
colleges, where in addition to the usual academic subjects, students
are required to select one "technology" as a special subject out of

twenty technology subjects, such as agriculture, animal husbandry, electrical technology and food technology. There are also special institutes for technical and vocational training. Thus, the emphasis is on training technicians and skilled workers geared to the developmental needs of the country. Another recent development in higher education is the introduction of the correspondence system, resulting in fairly wide expansion of the opportunity for studying higher education in Burma.

In the field of health, priority is given to preventive measures and the People's Health Programme has been formulated accordingly. This is a comprehensive health programme consisting of six sub-programmes. These are (a) the primary health care and basic health services programme, (b) the family health programme, (c) the expanded programme for immunization, (d) vector-borne diseases control programme, (e) environmental sanitation programme, and (f) the medical care programme. These programmes will be supported by six projects which include health information and services system, health laboratory services, supply, maintenance and repair services, health practices research, development of production and quality control of biological and pharmaceutical products, and development of procedures and staff training.

Initially, the People's Health Programme will cover 147 townships. In order to implement the various programmes and projects the existing staff of the basic health services and special disease control projects will be given re-orientation training courses. During the four years, about 5,000 community health workers will be trained and rural health centers will also be staffed with more qualified personnel. Thus, the gap between the urban and rural health facilities will be narrowed, which is another main objective of the Third Four-Year Plan.

II-3. Five-Year Development Programme

1) General

   Burma looks forward to 1979-80, the second year of the Third
Four Year Plan, with confidence and optimism. It aims at maintaining
a high level of investment and high rate of growth of GDP. The tar-
get growth rate of GDP is 5.9 percent and the level of public capital
expenditure is set at K 4,470 million (US$650 million), with a foreign
exchange component of about K 2,000 million (US$290 million). Some
of the macro-economic targets are given in Tables K-2-12 and K-2-13.
Below are some of the measures which will support the endeavours to
achieve the targets of the Plan.

   (i)   To expand the current programme of intensification of
          agricultural production.

   (ii)   To continue monitoring and coordination by the Task Force
          of the work of the various State Economic Enterprises
          connected with the export trade.

   (iii) To take measures to diversify exports in terms of searching
          for new export products as well as markets.

   (iv)   To make a general review of official prices.

   (v)   To intensify the mobilisation of domestic resources.

   (vi)   To maintain the stabilisation programme.

   (vii) To implement further the scheme of commercialisation of
          the State Economic Enterprises.

   (viii) To strengthen the cooperative sector.

   (ix)   To encourage the private sector to participate in production
          and investment in accordance with the Private Enterprise Law.

   (x)   To expand economic cooperation with other countries and
          international economic organisations.

TABLE K-2-12 PROJECTION OF G.D.P. & EXTERNAL RESOURCES
(at 1979/80 prices)

(Unit: Kyat million)

Particulars	1979/80[1/]	1980/81	1981/82	1982/83	1983/84	1984/85
Gross Domestic Product	32,875	34,979	37,253	39,712	42,372	45,253
Investment	5,590	6,040	6,560	7,150	7,840	8,650
Investment/GDP Ratio (%)	17.0	17.3	17.6	18.0	18.5	19.1
Imports	4,372	4,591	4,820	5,061	5,314	5,580
Exports	2,589	2,897	3,245	3,634	4,074	4,563
Non-Trade (Net)	-393	-410	-425	-443	-460	-482
Repayment of Foreign Loans	531	554	570	588	610	635
Foreign Exchange Gap	-2,707	-2,658	-2,570	-2,458	-2,310	-2,134

Note: 1/ Base Year

Source: Ministry of Planning and Fiance

TABLE K-2-13 GOVERNMENT RECEIPT AND EXPENDITURES
(at 1979/80 prices)

(Unit: Kyat million)

Particulars	1979/80[1/]	1980/81	1981/82	1982/83	1983/84	1984/85
1. Government Revenue						
-Receipt from Taxes	3,272	3,568	3,874	4,213	4,629	5,023
-Contribution from State Enterprises	729	843	849	1,070	1,206	1,345
-Other Recedpts[2/]	551	571	602	641	688	740
-Sub-total	4,552	4,982	5,425	5,924	6,523	7,108
2. Surplus of State Enterprises	1,154	1,429	1,665	1,935	2,235	2,560
3. Current Expenditures						
-Pyith Hluttaw, State Council etc., Ministries & Department	3,959	4,180	4,410	4,670	4,960	5,250
-Local Bodies	122	125	132	143	154	166
-Sub-total	4,081	4,305	4,542	4,813	5,114	5,416
4. Surplus(+)/Deficit(-) from the Financial Account	-537	-500	-470	-440	-410	-390
5. Capital Expenditures	4,470	4,830	5,120	5,360	5,640	5,920
6. Overall Surplus(+)/ Deficit(-)	-3,382	-3,224	-3,042	-2,754	-2,406	-2,058

Note: 1/ Base Year, 2/ Including Representative Bodies and Local Bodies

Source: Ministry of Planning and Finance

Since development planning is a continuous process Burma looks forward a few years beyond 1981-82 in order to give some indications of the aims and objectives of the development effort of Burma. Macro-economic projections on the basis of these thoughts are given in Tables K-2-12 and K-2-13. Some of these projections may appear to be somewhat ambitious. For example, between 1980-81 and 1984-85 average annual public investment is projected to be about K 5,374 million (US$776 million) and the resulting foreign exchange gap is estimated to be about K 2,424 million (US$350 million) per annum. The experience of the last two years has demonstrated that the absorptive capacity of Burma has improved and that it will not encounter much difficulty in the utilisation of about US$350 million of foreign loans and grants a year. More important, Burma seems to have achieved a breakthrough in her search for a method to raise agricultural productivity. With further improvement in the efficiency of the State Economic Enterprises and the fiscal system it is believed that the necessary domestic resources will also be mobilised to successfully carry out the economic development set out in the Five-Year Development Programme.

2) Plan Period

The plan period of Five-Year Development Programme is 1980/81 through 1984/85.

3) Investment Programme

Table K-2-14 shows the sectoral investment cost for the priority projects to be negotiated under the Five-Year Development Programme amounting K 38,426 million of which K 20,837 million would be a foreign currency cost.

Out of the above investment cost for the priority projects, Table K-2-15 indicates the sectoral investment cost for the top priority projects to be negotiated, amounting K 22,603 million of which K 2,558 million would be a foreign cost.

TABLE K-2-14 PRIORITY PROJECTS TO BE NEGOTIATED

(Unit: Kyat million)

Name of Sector	Total Project Cost		1980/81		1981/82		1982/83		1983/84		1984/85		Five Year Total	
	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.
1. Agriculture	6,390	3,403	905	517	1,136	641	1,381	821	1,194	583	929	414	5,545	2,976
2. Livestock and Fishery	608	342	135	69	208	131	193	111	41	17	25	11	602	339
3. Forestry	734	378	327	172	148	84	130	72	81	46	13	4	699	378
4. Mining	770	560	171	145	169	137	202	131	110	71	86	55	738	539
5. Processing and Manufacturing	7,084	4,330	262	118	593	312	1,489	833	2,740	1,841	1,689	1,054	6,773	4,158
6. Power	15,668	7,465	171	103	360	210	853	506	875	491	1,025	555	3,284	1,865
7. Construction	1,343	421	62	12	182	59	173	48	135	41	138	40	690	200
8. Transport and Communications	3,595	2,229	805	503	595	319	1,187	733	457	281	296	221	3,340	2,057
9. Trade	1,087	455	232	105	359	138	329	125	144	77	-	-	1,064	445
10. Social and Others	1,147	804	102	89	164	137	283	184	301	197	248	164	1,098	771
11. Total	38,426	20,387	3,172	1,833	3,914	2,168	6,220	3,564	6,078	3,645	4,449	2,518	23,833	13,728

Source: Ministry of Planning and Finance

TABLE K-2-15 TOP PRIORITY PROJECTS TO BE NEGOTIATED

(Unit: Kyat million)

Name of Sector	Total Project Cost		1980/81		1981/82		1982/83		1983/84		1984/85		Five Year Total	
	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.	Total	F.E.
1. Agriculture	5,289	2,745	801	449	970	523	1,029	542	1,030	467	844	392	4,674	2,373
2. Livestock and Fishery	502	298	113	59	174	118	160	96	25	12	25	11	497	296
3. Forestry	734	378	327	172	148	84	130	72	80	46	13	4	698	378
4. Mining	601	448	130	112	138	113	139	94	87	58	75	49	569	426
5. Processing and Manufacturing	6,197	3,791	230	98	496	255	1,251	688	2,433	1,656	1,475	923	5,885	3,620
6. Power	3,347	1,462	146	89	242	142	534	295	580	322	683	366	2,185	1,214
7. Construction	276	54	55	11	55	11	55	11	55	10	56	11	276	54
8. Transport and Communications	3,423	2,123	737	470	549	293	1,146	703	440	265	296	221	3,168	1,952
9. Trade	1,087	455	232	105	359	138	329	125	144	77	-	-	1,064	445
10. Social and Others	1,147	804	102	89	164	137	283	184	301	197	248	164	1,098	771
11. Total	22,603	12,558	2,873	1,654	3,295	1,814	5,056	2,810	5,175	3,110	3,715	2,141	20,114	11,529

Source: Ministry of Planning and Finance

4) Technical Assistance

Table K-2-16 shows the list of technical assistance projects
under the Five-Year Development Programme.

TABLE K-2-16   TECHNICAL ASSISTANCE PROJECTS

Sector	Name of Project
Agriculture	Area Development (Central Burma).
	Sittang Valley Irrigation Project (Yenwe-Pyuntaza).
	Land Development and Settlement.
	Agricultural Research and Seeds.
	Hydraulic Laboratory Instruments and Expert Services.
	Mathematical Model Studies for the Irrawaddy Delta.
	Comprehensive Feasibility Study of Kunchaung Dam Project.
Livestock and fishery	Inland Fisheries.
	Fish Harbour.
Forestry	Forest Industries Project Phase II (Tenasserim Division).
Mining	Metallurgical Research and Development Center Burma.
	Geological Survey and Exploration for Copper (Lapadaung).
	Geological Survey for Tin, Tungsten and Associated Mineral.
	Arakan Range Geological Survey and Mineral Exploration.
	Geological Survey for Chromite and Nickel.
	Phosphate Exploration and Utilization.
Processing and Manufacturing	Thaton Cement Mill Project.
	Zeyawaddy Integrated Sugar Mill Project.
	Wood Processing Project.
	Jute Development Research.
Power	Mindon Hydro-electric Power Project.
	Yenwe Multi-purpose Hydro-electric Power Project.
	Myanaung-Prome-Hlawga 230 KV Transmission line (200 miles).

Sector	Name of Project
	Mogok Hydro-electric Power Project
	Paunglaung Hydro-electric Power Project.
	Zaungtu Hydro-electric Power Project.

Construction

Bridge Construction Programme

Construction of Syriam Bridge across Pegu River (3500 Rft)

Road Construction and Improvement Programme

Irrawaddy (Area I) Road Project -

(1) Construction of Bassein-Monywa Road (Bassein-Henzada-Myanaung-Okshitpin-Kama Section) (237 miles).

(2) Construction of Toungoo-Prome-Taungup Road (Oktwin-Prome Section) (110 miles).

(3) Construction of Rangoon-Yandoon-Pantanaw-Kyaunggon-Bassein Road (77 miles).

(4) Construction of Dallah-Kanbe-Kungyangon-Dedaye-Pyapon-Kyongadun-Katonkani Road (77 miles).

(5) Consttuction of Gwa-Ngathainggyaung Road (47 miles).

(6) Construction of Bassein-Shawbya-Chaungtha Road (36 miles).

(7) Improvement of Rangoon-Prome Road (179 miles).

(8) Improvement of Taungup-Sandoway-Gwa Road (107 miles).

Construction of Pyinmana-Pinlaung Road (50 miles).

Construction of Mandalay-Shwebo-Myitkyina Road (180 miles).

Improvement of Rangoon-Moulmein-Tavoy-Mergui Road (65 miles).

Improvement of Shwebo-Ye U-Kalaywa Road (134 miles).

Improvement of Rangoon-Mandalay-Lashio-Bhamo-Myitkyina Road (Mandalay-Lashio Section) (175 miles).

Improvement of Chuk-Meiktila-Taunggyi-Kengtung-Tachileik Road (511 miles).

Transport and Communications

Extension and Development of Rangoon Mingaladon International Airport.

(Cont'd)

Sector	Name of Project
	Burma Outports Development Project.
	Electrification of Rangoon Suburban Line.
	Flight Calibration and Flight Check Unit.
	Dry-Dock Project.
	Fleet Construction Project.
Trade	Rice Silos Project.
Social and Others	Social
	Technical Education.
	Motion Picture Development.
	Radio Broadcasting in Burma.
	Renewal of Printing Facilities for Mass Communications Services.
	Others
	Rangoon Water Supply Project.
	Urban Water Supply Project.
	Rangoon City Development Planning Project.

III. REGIONAL ECONOMIC ANALYSIS

III-1. Demand and Supply Analysis

1) Population Projection

As shown in Table K-1-1, Burma's population is estimated at 32,206 thousand in 1978 with an average annual growth rate of 2.2 percent since 1961.

In Table K-3-1, Burma's population has been projected at the end of every Four-Year Plan period by Immigration and Manpower Department, and the projected growth rate for every four years are as follows:

Period	Annual Growth Rate (%)
1979 - 1982	2.20
1983 - 1986	2.24
1987 - 1990	2.27
1991 - 1994	2.37

Applying the above growth rate and assuming that the rate after 1995 is 2.3 percent, the future population is as follows:

Year	Population (Union Total) ('000)
1985/86	37,553
1990/91	42,008
1995/96	47,184
2000/01	52,865

2) Production Projection

a) Methodology

As for main agricultural crops such as paddy, maize, groundnuts, sesame, pulses, jute and cotton, the available data and information concerning with crop production have been statistically analyzed.

The items to be adopted for the analysis are production, yield, sown acreage, urea input, price of each crop, and irrigated area, number of village manager, total population, draft animal and time trend.

Figure K-3-1 indicates flow chart of the said statistical analysis on projection of crop production.

   b) Arrangement of Available Data

Table K-3-2 shows past trend of production, sown acreage and yield of selected crops. In this table, yield of each crop is calculated on the basis of sown acreage.

Urea input is referred to Table C-1-15 of Annex C "Agriculture".

Price of selected crops, irrigated area, number of village manager, population and draft animal are referred to "Report to the Pyithu Hluttaw, 1978/79" and other available sources. Number of draft animal includes both cattle and water buffalo.

   c) Correlation Coefficient Analysis

Due to limitation of number of available data on urea input, the analysis covers 8 years from 1970/71 to 1977/78. Table K-3-4 shows summary of the analysis concerning with yield and sown acreage. Details are compiled in Appendix K-1. Because of the limited number of time series data, most of the results are not satisfactory from statistical point of view. And also, the results show that crop production in Burma have been considerably affected by climatic condition.

   d) Multiple Regression Analysis

Variables for the multiple regression analysis are as follows:

Dependent: Sown Acreage (S.A.)
                 Yield (Y)

Independent: Urea Input (U.I.)
                 Crop Price (C.P.)
                 Irrigated Area (I.A.)
                 Number of Village Manager (V.M.)
                 Total Population (T.P.)
                 Draft Animal (D.A.)

In case of paddy, a cubic linear equation has been applied because the correlation coefficient analysis gives favorable result, while a quadratic linear equation has been applied to other crops.

By trial and error method, regression equations are computed except sown acreage of groundnuts and jute, and yield of sesame.

- Paddy

$$Y = -429.7470 - 0.0009 \text{ U.I.} + 0.3360 \text{ C.P.} + 0.2497 \text{ D.A.}$$
$$\text{S.A.} = 25,572.8229 + 2.5105 \text{ C.P.} + 0.2304 \text{ V.M.} + 3.5141 \text{ D.A.}$$

- Maize

$$Y = 163.7179 + 0.0277 \text{ C.P.} + 0.0180 \text{ V.M.}$$
$$\text{S.A.} = -3,135.2529 - 0.1086 \text{ C.P.} + 0.8132 \text{ D.A.}$$

- Groundnuts

$$Y = -455.2728 - 0.0245 \text{ C.P.} + 0.0282 \text{ T.P.}$$

- Sesame

$$\text{S.A.} = 1,612.1424 - 0.0127 \text{ C.P.} + 0.2059 \text{ V.M.}$$

- Pulses

$$Y = 277.4337 + 0.0104 \text{ C.P.} - 0.0568 \text{ I.A.}$$
$$\text{S.A.} = -5,298.4421 - 0.0914 \text{ C.P.} + 1.7028 \text{ D.A.}$$

- Jute

$$Y = -6,162.2000 - 1.9167 \text{ C.P.} + 1.5860 \text{ D.A.}$$

- Cotton

$$Y = -360.5648 - 0.0086 \text{ V.M.} + 0.1142 \text{ D.A.}$$
$$\text{S.A.} = -709.8898 + 0.8273 \text{ I.A.} - 0.1378 \text{ V.M.}$$

Table K-3-5 summarizes the result of multiple regression analysis with some statistical values.

e) Projection of Independent Variables

Assuming that the past trend of the independent variables will continue for the projection period, they are projected by applying a linear regression line. The regression equation applied is as follows:

$$Y = a + bt$$

Where: Y: Crop Prices, Irrigated Area, Village Manager, Draft Animal
        t: Time Trend
        a: Intercept
        b: Coefficient

Tables K-3-6 and K-3-7 show the result of the regression analysis and projected values of each variable. In Table K-3-7, the more number of time series data gives the better statistical values so that the projected figures computed by the longer time series data have been adopted for the next procedure.

f) Projection of Yield

By multiplying the coefficients computed in the multiple regression analysis by the projected values of the independent variables, future crop yields can be calculated as shown in Table K-3-8 and summarized in the following.

Projection of Yield

(Unit: Kg/acre)

	1985/86	1990/91	1995/96	2000/01
Paddy	876	959	1,043	1,126
Maize	426	486	547	607
Groundnuts	309	349	407	480
Pulses	210	226	242	259
Jute	325	354	384	412
Cotton	102	112	121	130

As for yield of sesame, the multiple regression analysis does not indicate satisfactory result, therefore, considering the past trend, it has been estimated as follows:

Average yield for 11 years: 45 kg/acre

Annual increase: 1.5% of average yield

Thus, future yield of sesame can be obtained in the following:

Projected Year	Sesame Yield (kg/ac)
1985/86	50
1990/91	54
1995/96	57
2000/01	61

g) Projection of Sown Acreage

In the same manner as the projected yield, future sown acreage can be computed as shown in Table K-3-9, and summarized below.

Projection of Sown Acreage

(Unit: 1,000 ac)

	1985/86	1990/91	1995/96	2000/01
Paddy	13,135	13,389	13,643	13,900
Maize	231	240	249	258
Sesame	2,897	3,056	3,214	3,372
Pulses	1,839	1,891	1,943	1,993
Cotton	505	518	532	545

As for sown acreage of groundnuts and jute, they are estimated by applying the past 11-year trend as a linear equation.

	Sown Acreage (1,000 ac)	
Projected Year	Groundnuts	Jute
1985/86	1,742	273
1990/91	1,810	313
1995/96	1,877	354
2000/01	1,944	395

h) Projection of Crop Production

On the basis of the projected crop yield and sown acreage, the projected crop production can be estimated in Table K-3-10, and summarized in the following.

Projection of Crop Production

(Unit: 1,000 tons)

	1985/86	1990/91	1995/96	2000/01
Paddy	11,506	12,840	14,230	15,651
Maize (Seed)	98	117	136	157
Groundnuts	538	632	764	933
Sesame	145	165	183	206
Pulses	386	427	470	516
Jute	89	111	136	163
Cotton	52	58	64	71

3) Projection of Demand

   a) Per Capita Consumption

On the basis of available data, domestic consumption of various crop per capita is estimated as shown in Table K-3-11. In Table K-3-11, it is observed that per capita consumption for most of all crops fluctuates with wide range, which makes it unable to apply the income elasticity analysis for estimation of future crop consumption per capita. In this context, the future crop consumption per capita has been arbitrarily estimated in consideration of the past records as shown below.

<p style="text-align:center">Per Capita Consumption of Selected Crops</p>

<p style="text-align:right">(Unit: kg)</p>

Crop	Per Capita Consumption
Paddy	270.0
Maize (Seed)	3.0
Groundnuts	12.5
Sesame	5.0
Pulses	10.0
Jute	1.5
Cotton	1.0

   b) Domestic Consumption

Table K-3-12 shows the future domestic consumption of selected crops as summarized in the succeeding page.

Domestic Consumption

(Unit: 1,000 tons)

Crop	1985/86	1990/91	1995/96	2000/01
Paddy	10,123	11,342	12,740	14,274
Maize (Seed)	112	126	142	159
Groundnuts	469	525	590	661
Sesame	187	210	236	264
Pulses	375	420	472	529
Jute	56	63	71	79
Cotton	37	42	47	53

4) Balance of Demand and Supply

a) Seed and Wastage

Table K-3-13 indicates the past records on seed and wastage of various crops and gives the average rate of seed and wastage against total production of the selected crops.

Average Rate of Seed Wastage

Crop	Seed & Wastage Rate (%)
Paddy	1.0
Maize	5.0
Groundnuts	30.0
Sesame	10.0
Pulses	10.0
Jute	–
Cotton	–

b) Projected Balance of Selected Crops

Taking into consideration the rate of seed and wastage, the future supply and demand of selected crops and their balance can be estimated. Table K-3-14 shows the balance of supply and demand of the selected crops, and the projected balance is summarized as follows:

Projected Balance of Selected Crops

(Unit: 1,000 tons)

Crop	1985/86	1990/91	1995/96	2000/01
Paddy	1,268	1,370	1,348	1,220
Maize (Seed)	(-) 19	(-)15	(-)13	(-)10
Groundnuts	(-) 92	(-)83	(-)55	(-) 8
Sesame	(-) 57	(-)62	(-)71	(-)79
Pulses	(-) 28	(-)36	(-)49	(-)65
Jute	33	48	65	84
Cotton	15	16	17	18

(-) : deficit

While paddy, jute and cotton are projected to have surplus of which paddy and jute are export oriented crop, maize, groundnuts, sesame and pulses are projected to be deficient by the target year of 2000/01.

Though paddy would have about 1.2 million tons of surplus which is equivalent to 0.7 million tons in terms of milled rice, the maximum quantity of milled rice to be exported is only 0.7 million tons without considering any domestic stock of rice, which is more or less same quantity of the present export and far from the maximum quantity of about 3 million tons experienced in the past.

TABLE K-3-1 POPULATION PROJECTION

(in thousand)

	1974	1978	1982	1986	1990	1994
Male	14,672	16,006	17,442	19,020	20,796	22,806
Female	14,849	16,200	17,696	19,374	21,212	23,317
Total	29,521	32,206	35,138	38,394	42,008	46,123

Age Distribution

	1974	1978	1982	1986	1990	1994
0 - 4	4,693	5,121	5,569	6,064	6,652	7,342
5 - 9	3,901	4,256	4,657	5,099	5,552	6,128
10 - 14	3,362	3,667	4,031	4,456	4,895	5,340
Sub-total	11,956	13,044	14,257	15,619	17,099	18,810
15 - 19	2,923	3,188	3,492	3,852	4,288	4,706
20 - 24	2,496	2,725	2,992	3,308	3,641	4,066
25 - 29	1,971	2,150	2,433	2,813	3,117	3,447
30 - 34	1,928	2,104	2,203	2,289	2,640	2,937
35 - 39	1,717	1,873	2,014	2,108	2,121	2,457
40 - 44	1,483	1,618	1,757	1,891	2,010	2,026
45 - 49	1,257	1,370	1,494	1,624	1,756	1,879
50 - 54	1,095	1,194	1,278	1,356	1,482	1,610
55 - 59	924	1,008	1,082	1,142	1,204	1,291
Sub-total	15,794	17,230	18,745	20,383	22,259	24,419
60 - 64	729	795	863	928	986	1,046
65 - 69	482	525	596	690	751	807
70 - 74	308	337	371	421	502	554
75 and above	252	275	306	353	411	487
Sub-total	1,771	1,932	2,136	2,392	2,650	2,894
Total	29,521	32,206	35,138	38,394	42,008	46,123

Source: Immigration and Manpower Department
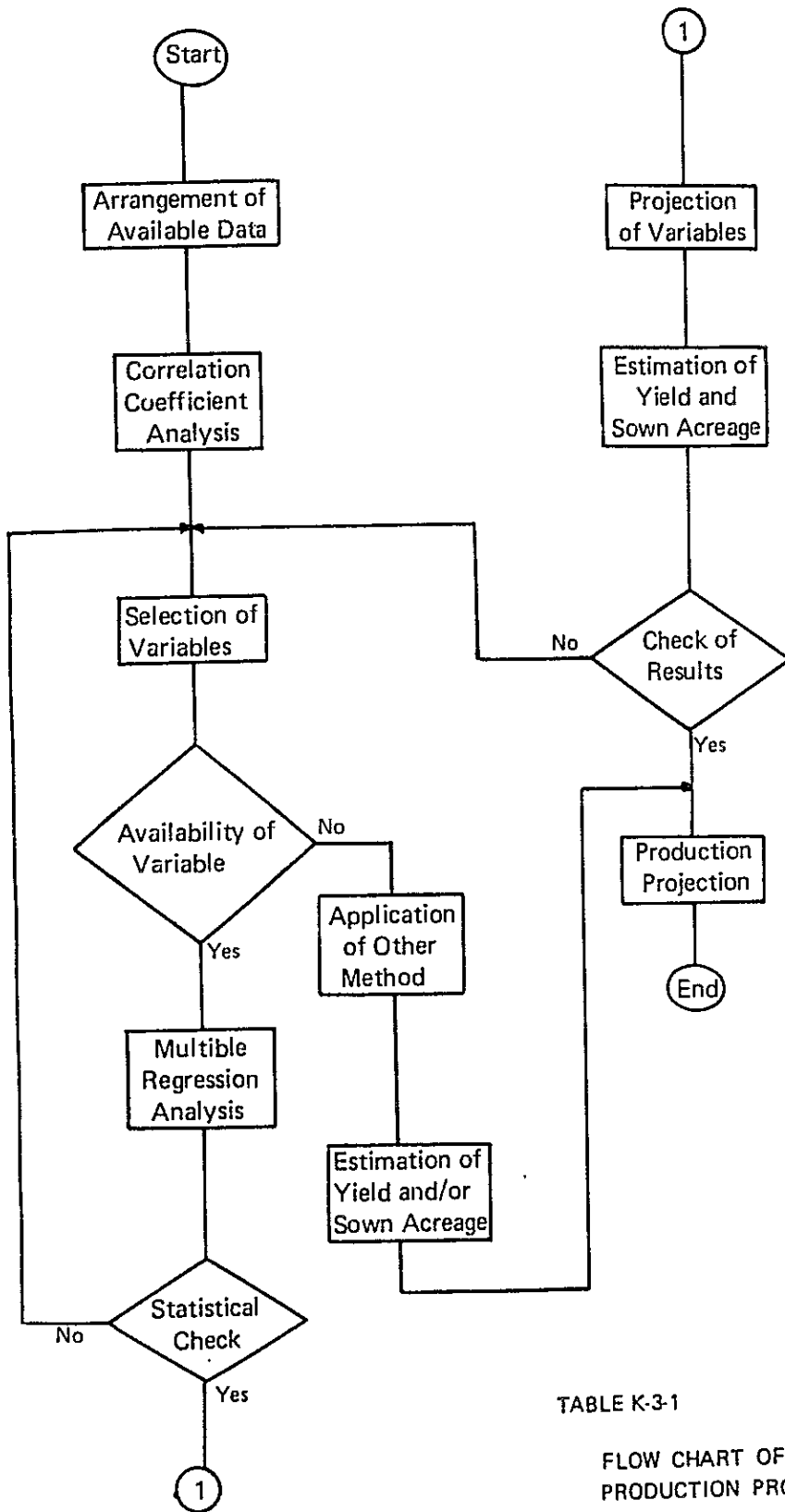
TABLE K-3-1

FLOW CHART OF
PRODUCTION PROJECTION

TABLE K-3-2 PRODUCTIVITY OF SELECTED CROPS

(Unit: Sown Acreage - 1,000 acres, Production - 1,000 long tons, Yield - kg/ac)

		61/62	64/65	67/68	68/69	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77[2]	77/78[3]
Paddy	Sown Acreage	11,359	12,624	12,193	12,402	12,243	12,294	12,300	12,014	12,575	12,793	12,858	12,547	12,736
	Production	6,726	8,373	7,647	7,896	7,859	8,033	8,046	7,241	8,466	8,448	9,062	9,172	9,489
	Yield	602	674	637	647	652	664	665	612	672	671	716	743	757
Maize	Sown Acreage	199	221	232	216	179	176	250	235	219	215	203	199	207
	Production	55	53	64	61	47	47	57	55	61	64	60	57	74
	Yield	281	244	280	287	268	273	232	238	283	302	300	291	362
Pulses[1]	Sown Acreage	1,384	1,609	1,616	1,751	1,631	1,576	1,855	1,861	1,687	1,785	1,656	1,666	1,749
	Production	260	281	264	314	269	285	313	265	264	301	256	314	347
	Yield	190	178	166	182	167	184	171	145	159	171	157	191	202
Ground-nut	Sown Acreage	1,396	1,332	1,259	1,510	1,510	1,735	1,674	1,563	1,638	1,666	1,696	1,507	1,481
	Production	387	338	365	392	437	521	478	377	405	459	404	416	457
	Yield	282	258	295	264	294	305	290	245	252	284	242	281	313
Sesamum	Sown Acreage	1,530	1,960	2,050	2,037	2,258	2,510	2,292	2,256	2,660	2,609	2,464	2,630	2,696
	Production	75	99	106	82	100	130	111	69	152	94	132	91	109
	Yield	50	52	53	41	45	53	49	31	58	37	54	35	41
Jute	Sown Acreage	24	53	87	99	104	115	226	288	291	167	148	136	176
	Production	6	10	22	21	22	28	65	88	78	39	37	27	55
	Yield	250	189	253	212	212	243	292	309	271	240	257	199	318
Cotton	Sown Acreage	469	616	526	389	362	467	554	532	527	542	514	402	405
	Production	21	68	48	32	34	42	42	43	37	42	37	31	41
	Yield	45	112	93	84	95	91	77	82	71	79	73	78	103

Source: Report to the Pyithu Hluttaw

Note: 1/ See Table K-3-3. 2/ Provisional Actual. 3/ Provisional

TABLE K-3-3   SOWN ACREAGE, PRODUCTION AND YIELD OF PULSES

Item	Crop	61/62	64/65	67/68	68/69	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77	77/78
Sown Acreage (1,000 acres)	Matpe	123	216	175	158	130	135	189	184	164	164	121	88	164
	Butter bean	73	160	176	147	142	132	196	207	183	180	158	143	157
	Sultapaya	10	69	90	93	84	90	126	134	107	122	117	126	137
	Soya bean	38	34	43	43	46	49	50	51	52	54	56	61	59
	Gram	291	271	272	410	350	358	457	449	379	373	385	434	442
	Other pulses	849	859	860	900	879	812	837	836	802	892	819	814	790
	Total	1,384	1,609	1,616	1,751	1,631	1,576	1,855	1,861	1,687	1,785	1,656	1,666	1,749
Production (1,000 long tons)	Matpe	27	47	26	21	17	21	29	32	24	23	15	12	34
	Butter bean	12	30	34	32	26	29	41	36	41	36	34	32	36
	Sultapaya	2	14	16	14	12	17	23	22	13	16	17	26	30
	Soya bean	10	7	10	11	12	13	13	13	12	13	12	16	16
	Gram	45	54	52	80	60	70	89	60	54	66	67	93	100
	Other pulses	164	129	126	156	142	135	118	102	120	147	111	135	131
	Total	260	281	264	314	269	285	313	265	264	301	256	314	347
Yield (kg/ac)	Matpe	224	221	151	135	133	159	155	177	148	142	126	138	210
	Butter bean	167	191	196	221	186	224	212	177	228	203	218	228	233
	Sultapaya	203	206	181	153	145	192	186	167	123	133	147	209	223
	Soya bean	267	209	237	260	265	269	264	259	235	245	217	266	275
	Gram	157	202	194	198	174	199	198	136	144	180	177	217	230
	Other pulses	196	152	149	176	165	169	143	124	152	168	138	169	169
	Average	190	178	166	182	167	184	171	145	159	171	157	191	202

Source: Report to the Phithu Hluttaw

TABLE K-3-4 SUMMARY OF CORRELATION COEFFICIENT ANALYSIS

	Urea Input	Crop Price	Irrigated Area	Village Manager	Population	Draft Animal	Time Trend
Paddy							
Yield	0.756	0.892	0.515	0.712	0.831	0.822	0.825
Sown Acreage	0.653	0.734	0.843	0.794	0.705	0.556	0.708
Maize							
Yield	0.175	0.783	0.620	0.775	0.808	0.727	0.803
Sown Acreage	0.063	-0.326	0.057	-0.237	-0.185	-0.124	-0.178
Groundnuts							
Yield	-0.507	-0.169	-0.307	-0.113	0.051	0.133	0.036
Sown Acreage	0.297	-0.462	-0.266	-0.523	-0.695	-0.777	-0.690
Sesame							
Yield	-0.070	-0.236	0.031	-0.140	-0.308	-0.434	-0.308
Sown Acreage	0.463	0.605	0.561	0.771	0.625	0.477	0.622
Pulses							
Yield	-0.578	0.709	-0.023	0.275	0.434	0.492	0.420
Sown Acreage	0.287	-0.159	0.016	-0.203	-0.078	0.020	-0.073
Jute							
Yield	0.588	-0.225	-0.061	-0.247	-0.090	-0.026	-0.093
Sown Acreage	0.818	-0.450	0.051	-0.148	-0.252	-0.280	-0.244
Cotton							
Yield	0.048	0.199	-0.267	-0.034	0.205	0.307	0.189
Sown Acreage	0.085	-0.724	-0.029	-0.439	-0.603	-0.666	-0.591

TABLE K-3-5 MULTIPLE REGRESSION ANALYSIS

	Constant	Variable - 1	Variable - 2	Variable - 3	R	F. Value	No. of Data
Paddy Yield	-429.7470	Urea Input -0.0009	Paddy Price 0.3360	Draft Animal 0.2497	0.899	5.620	8
Paddy Sown Acreage	25,572.8229	Paddy Price 2.5105	Village Manager 0.2304	Draft Animal -3.5141	0.892	5.212	8
Maize Yield	163.7179	Maize Price • 0.0277	Village Manager 0.0180		0.810	4.756	8
Maize Sown Acreage	-3,135.2529	Maize Price -0.1086	Draft Animal 0.8132		0.814	4.927	8
Groundnuts Yield	-455.2728	G/N Price -0.0245	Population 0.0282		0.605	1.447	8
Sesame Sown Acreage	1,612.1424	Sesame Price -0.0127	Village Manager 0.2059		0.790	4.152	8
Pulses Yield	277.4337	Matpe Price 0.0104	Irrigated Area -0.0568		0.793	4.231	8
Pulses Sown Acreage	-5,298.4421	Mate Price -0.0914	Draft Animal 1.7028		0.507	0.864	8
Jute Yield	-6,162.2000	Jute Price -1.9167	Draft Animal 1.5860		0.822	5.219	8
Cotton Yield	360.5648	Village Manager -0.0086	Draft Animal 0.1142		0.546	1.060	8
Cotton Sown Acreage	-709.8898	Irrigated Area 0.8273	Village Manager -0.1378		0.915	12.909	8

TABLE K-3-6 REGRESSION ANALYSIS ON PRICE OF SELECTED CROPS

$$Y = a + bt$$

	Paddy	Maize	Groundnuts	Sesame	Matpe	Jute	Cotton
1. Unit	Ks/ℓ ton	Ks/100 BKTS	Ks/100 BKTS	Ks/100 BKTS	Ks/100 BKTS	Ks/100 Viss	Ks/100 Viss
2. n	8	8	8	8	8	8	8
3. a	83.9	-92.9	506.5	2,808.7	-105.4	47.9	-7.5
4. b	47.0	259.5	715.0	1,924.4	576.2	27.6	89.6
5. r	0.930	0.965	0.937	0.965	0.883	0.963	0.962
6. Fo	38.598	82.316	42.853	80.532	21.181	76.661	74.585
7. Projection							
1985/86	835	4,059	11,946	33,599	9,114	489	1,426
1990/91	1,070	5,357	15,521	43,220	11,995	627	1,874
1995/96	1,305	6,655	19,096	52,842	14,876	764	2,322
2000/01	1,540	7,952 .	22,670	62,464	17,757	902	2,770

TABLE K-3-7 REGRESSION ANALYSIS ON VARIABLES

$Y = a + bt$

	Draft Animal		Village Manager		Irrigated Area	
	n = 10	n = 8	n = 16	n = 8	n = 10	n = 8
1. Unit	1,000 head				1,000 acres	
2. a	4,015	4,116	1,773	3,583	1,978	2,115
3. b	37.0	32.1	272.5	335.6	48.6	41.5
4. r	0.978	0.965	0.960	0.920	0.887	0.778
5. Γo	172.742	81.218	165.863	33.010	29.515	9.212
6. Projection						
1985/86	4,681	4,630	8,314	8,952	2,853	2,779
1990/91	4,866	4,791	9,676	10,630	3,096	2,987
1995/96	5,051	4,951	11,039	12,308	3,340	3,194
2000/01	5,235	5,112	12,402	13,986	3,583	3,402

TABLE K-3-8 PROJECTION OF CROP YIELD

Paddy Yield (Y = -429.7470 - 0.0009 U.I. + 0.3360 C.P. + 0.2497 D.A.)

Coefficient	Constant -429.7470	Urea Input 0.0009	Paddy Price 0.3360	Draft Animal 0.2497	Projected Yield
1985/86	1	159,642	835	4,681	876
1990/91	1	206,179	1,070	4,866	959
1995/96	1	252,716	1,305	5,051	1,043
2000/01	1	299,253	1,540	5,235	1,126

Maize Yield (Y = 163.7179 + 0.0277 C.P. + 0.0180 V.M.)

Coefficient	Constant 163.7179	Maize Price 0.0277	Village Manager 0.0180	Projected Yield
1985/86	1	4,059	8,314	426
1990/91	1	5,357	9,676	486
1995/96	1	6,655	11,039	547
2000/01	1	7,952	12,402	607

Groundnuts Yield (Y = -455.2728 - 0.0245 C.P. + 0.0282 T.P.)

Coefficient	Constant -455.2728	G/N Price -0.0245	Population 0.0282	Projected Yield
1985/86	1	11,946	37,494	309
1990/91	1	15,521	42,008	349
1995/96	1	19,096	47,184	407
2000/91	1	22,670	52,865	480

TABLE K-3-8   PROJECTION OF CROP YIELD (Cont'd)

Pulses Yield $(Y = 277.4337 + 0.0104 \text{ C.P.} - 0.0568 \text{ I.A.})$

Coefficient	Constant 277.4337	Matpe Price 0.0104	Irrigated Area -0.0568	Projected Yield
1985/86	1	9,114	2,853	210
1990/91	1	11,995	3,096	226
1995/96	1	14,876	3,340	242
2000/01	1	17,757	3,583	259

Jute Yield $(Y = -6,162.200 - 1.9167 \text{ C.P.} + 1.5860 \text{ D.A.})$

Coefficient	Constant -6,162.2000	Jute Price -1.9167	Draft Animal 1.5860	Projected Yield
1985/86	1	489	4,681	325
1990/91	1	627	4,866	354
1995/96	1	764	5,051	384
2000/01	1	902	5,235	412

Cotton Yield $(Y = -360.5648 - 0.0086 \text{ V.M.} + 0.1142 \text{ D.A.})$

Coefficient	Constant -360.5648	Village Manager -0.0086	Draft Animal 0.1142	Projected Yield
1985/86	1	8,314	4,681	102
1990/91	1	9,676	4,866	112
1995/96	1	11,039	5,051	121
2000/01	1	12,402	5,235	131

TABLE K-3-9   PROJECTION OF SOWN ACREAGE

Paddy Sown Acreage
(S.A. = 25,572.8229 + 2.5105 C.P. + 0.2304 V.M. - 3.5141 D.A.)

Coefficient	Constant 25,572.8229	Paddy Rice 2.5105	Village Manager 0.2304	Draft Animal -3.5141	Projected Sown Acreage
1985/86	1	835	8,314	4,681	13,135
1990/91	1	1,070	9,676	4,866	13,389
1995/96	1	1,305	11,039	5,051	13,643
2000/01	1	1,540	12,402	5,235	13,900

Maize Sown Acreage (S.A. = -3,135.2529 - 0.1086 C.P. + 0.8132 D.A.)

Coefficient	Constant -3,135.2529	Maize Price -0.1086	Draft Animal 0.8132	Projected Sown Acreage
1985/86	1	4,059	4,681	231
1990/91	1	5,357	4,866	240
1995/96	1	6,655	5,051	249
2000/01	1	7,952	5,235	258

Sesame Sown Acreate (S.A. = 1,612.1424 - 0.0127 C.P. + 0.2059 V.M.)

Coefficient	Constant 1,612.1424	Sesame Price -0.0127	Village Manager 0.2059	Projected Sown Acreage
1985/86	1	33,599	8,314	2,897
1990/91	1	43,221	9,676	3,056
1995/96	1	52,842	11,039	3,214
2000/01	1	62,464	12,402	3,372

Pulses Sown Acreage (S.A. = -5,298.4421 - 0.0914 C.P. + 1.7028 D.A.)

Coefficient	Constant -5,298.4421	Matpe Price -0.0914	Draft Animal 1.7028	Projected Sown Acreage
1985/86	1	9,114	4,681	1,839
1990/91	1	11,995	4,866	1,891
1995/96	1	14,876	5,051	1,943
2000/01	1	17,757	5,235	1,993

Cotton Sown Acreage (S.A. = -709.8898 + 0.8273 I.A. - 0.1378 V.M.)

Coefficient	Constant -709.8898	Irrigated Area 0.8273	Village Manager -0.1378	Projected Sown Acreage
1985/86	1	2,853	8,314	505
1990/91	1	3,096	9,676	518
1995/96	1	3,340	11,039	532
2000/01	1	3,583	12,402	545

TABLE K-3-10 PROJECTION OF CROP PRODUCTION

	1985/86	1990/91	1995/96	2000/01
Paddy				
Sown Acreage (1,000 ac)	13,135	13,389	13,643	13,900
Yield (Kg/ac)	876	959	1,043	1,126
Production (1,000 tons)	11,506	12,840	14,230	15,651
Maize (Seed)				
Sown Acreage (1,000 ac)	231	240	249	258
Yield (Kg/ac)	426	486	547	607
Production (1,000 tons)	98	117	136	157
Groundnuts				
Sown Acreage (1,000 ac)	1,742	1,810	1,877	1,944
Yield (Kg/ac)	309	349	407	480
Production (1,000 tons)	538	632	764	933
Sesame				
Sown Acreage (1,000 ac)	2,897	3,056	3,214	3,372
Yield (Kg/ac)	50	54	57	61
Production (1,000 tons)	145	165	183	206
Pulses				
Sown Acreage (1,000 ac)	1,839	1,891	1,943	1,993
Yield (Kg/ac)	210	226	242	259
Production (1,000 tons)	386	427	470	516
Jute				
Sown Acreage (1,000 ac)	273	313	354	395
Yield (Kg/ac)	325	354	384	412
Production (1,000 tons)	89	111	136	163
Cotton				
Sown Acreage (1,000 ac)	505	518	532	545
Yield (Kg/ac)	102	112	121	131
Production (1,000 tons)	52	58	64	71

TABLEK-3-11 ESTIMATED PER CAPITA CONSUMPTION

Crop	1961/62 Domestic Use (ℓ.ton)	Per Capita (kg)	1973/74 Domestic Use (ℓ.ton)	Per Capita (kg)	1974/75 Domestic Use (ℓ.ton)	Per Capita (kg)	1975/76 Domestic Use (ℓ.ton)	Per Capita (kg)	1976/77 1/ Domestic Use (ℓ.ton)	Per Capita (kg)	1977/78 2/ Domestic Use (ℓ.ton)	Per Capita (kg)
Rice	2,255,421	103.2	4,579,077	161.1	4,642,516	159.8	4,616,729	155.5	4,433,812	146.1	4,511,243	145.5
Wheat	19,117	0.9	27,885	1.0	68,563	2.4	56,590	1.9	69,726	2.3	86,404	2.8
Maize(Seed)	30,546	1.4	70,520	2.5	70,364	2.4	71,020	2.4	69,029	2.3	80,115	2.6
Millet	-	-	25,744	0.9	30,299	1.0	27,101	0.9	36,076	1.2	45,287	1.5
Pulses	115,127	5.3	202,599	7.1	227,842	7.8	195,151	6.6	263,916	8.7	291,309	9.4
Groundnut	264,849	12.1	273,546	9.6	322,807	11.1	283,200	9.5	296,192	9.8	334,966	10.8
Sesamum	69,036	3.2	141,448	5.0	84,349	2.9	121,660	4.1	81,124	2.7	99,039	3.2
Chillies	22,008	1.0	22,124	0.8	23,410	0.8	22,325	0.8	36,400	1.2	30,717	1.0
Onion	56,325	2.6	72,396	2.5	76,721	2.6	77,369	2.6	101,086	3.3	114,493	3.7
Garlic	11,680	0.5	13,463	0.5	13,395	0.5	12,874	0.4	14,366	0.5	15,784	0.5
Potatoes	34,826	1.6	47,347	1.7	38,175	1.3	43,802	1.5	46,186	1.5	49,694	1.6
Jute	18,139	0.8	27,996	1.0	-	-	23,697	0.8	23,326	0.8	38,912	1.3
Cotton	-	-	12,312	0.4	17,439	0.6	17,863	0.6	17,277	0.6	21,833	0.7
Sugarcane	1,043,827	47.8	1,451,730	51.1	944,004	32.5	1,345,746	45.3	1,308,032	43.1	1,492,053	48.1
Rubber	14,314	0.7	11,589	0.4	9,919	0.3	9,528	0.3	6,196	0.2	7,444	0.2
B. Tobacco	35,560	1.6	30,122	1.1	33,350	1.1	41,601	1.4	55,285	1.8	50,733	1.6
V. Tobacco	1,990	0.1	2,283	0.1	2,870	0.1	1,390	0.0	3,100	0.1	3,605	0.1

Note: 1/ Provisional Actual   2/ Provisional
Source: Report to the Pyithu Hluttaw

TABLE K-3-12 PROJECTION OF DOMESTIC USE OF SELECTED CROPS

	1985/86	1990/91	1995/96	2000/01
I. Projected Population ('000)	37,414	42,008	47,184	52,865
II. Domestic Use				
Paddy				
Per Capita Consumption (Kg)	270.0	270.0	270.0	270.0
Domestic Use (1,000 tons)	10,123	11,342	12,740	14,274
Maize (Seed)				
Per Capita Consumption (Kg)	3.0	3.0	3.0	3.0
Domestic Use (1,000 tons)	112	126	142	159
Groundnuts				
Per Capita Consumption (Kg)	12.5	12.5	12.5	12.5
Domestic Use (1,000 tons)	469	525	590	661
Sesame				
Per Capita Consumption (Kg)	5.0	5.0	5.0	5.0
Domestic Use (1,000 tons)	187	210	236	264
Pulses				
Per Capita Consumption (Kg)	10.0	10.0	10.0	10.0
Domestic Use (1,000 tons)	375	420	472	529
Jute				
Per Capita Consumption (Kg)	1.5	1.5	1.5	1.5
Domestic Use (1,000 tons)	56	63	71	79
Cotton				
Per Capita Consumption (Kg)	1.0	1.0	1.0	1.0
Domestic Use (1,000 tons)	37	42	47	53

TABLE K-3-13 SEED & WASTAGE RATE AGAINST PRODUCTION

(Unit: ℓ.ton)

		1961/62	1973/74	1974/75	1975/76	1976/77	1977/78	Total
Rice	A. Production	3,971,225	4,822,999	4,857,001	4,997,001	5,021,827	5,162,001	28,832,054
	B. Seed & Wastage	39,712	48,230	48,570	49,970	50,218	51,620	288,320
	C. B/A (%)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Maize	A. Production	54,827	77,942	79,287	78,748	79,135	94,676	464,615
	B. Seed & Wastage	2,735	3,842	3,780	4,160	4,028	4,184	22,729
	C. B/A (%)	5.0	4.9	4.8	5.3	5.1	4.4	4.9
Millet	A. Production	—	37,488	41,623	38,745	49,274	58,578	225,708
	B. Seed & Wastage	—	11,744	11,324	11,644	13,198	13,291	61,201
	C. B/A (%)	—	31.3	27.2	30.1	26.8	22.7	27.1
Pulses	A. Production	260,000	262,084	281,524	255,940	322,141	356,912	1,738,601
	B. Seed & Wastage	25,740	26,257	27,726	26,968	29,175	29,870	165,736
	C. B/A (%)	9.9	10.0	9.8	10.5	9.1	8.4	9.5
Groundnut	A. Production	387,114	405,372	459,362	404,346	416,186	457,001	2,529,381
	B. Seed & Wastage	122,265	131,826	136,555	121,146	119,994	122,035	753,821
	C. B/A (%)	31.6	32.5	29.7	30.0	28.8	26.7	29.8
Sesamun	A. Production	75,270	152,349	93,641	132,223	91,060	109,341	653,884
	B. Seed & Wastage	6,234	10,901	9,292	10,563	9,936	10,302	57,228
	C. B/A (%)	8.3	7.2	9.9	8.0	10.9	9.4	8.8
Chillies	A. Production	23,806	23,683	25,095	23,980	38,734	32,752	167,960
	B. Seed & Wastage	798	1,559	1,685	1,655	2,334	2,035	10,066
	C. B/A (%)	3.4	6.6	6.7	6.9	6.0	6.2	6.0
Onion	A. Production	68,206	85,151	89,770	92,099	118,529	133,425	587,180
	B. Seed & Wastage	11,881	12,755	13,049	14,730	17,443	18,932	88,790
	C. B/A (%)	17.4	15.0	14.5	16.0	14.7	14.2	15.1
Garlic	A. Production	21,000	19,350	19,225	19,171	20,863	22,310	121,919
	B. Seed & Wastage	9,320	5,887	5,830	6,297	6,497	6,526	40,357
	C. B/A (%)	44.4	30.4	30.3	32.8	31.1	29.3	33.1
Potatoes	A. Production	53,000	56,666	47,353	53,761	56,382	60,075	327,237
	B. Seed & Wastage	13,260	9,319	9,178	9,959	10,196	10,381	62,293
	C. B/A (%)	25.0	16.4	19.4	18.5	18.1	17.3	19.0

Source: Report to the Pyithu Hluttaw

TABLE K-3-14   PROJECTED BALANCE OF SELECTED CROPS

(Unit: 1,000 tons)

	Production	Seeds & Wastage	Supply	Domestic Demand	Balance
Paddy					
1985/86	11,506	115	11,391	10,123	1,268
1990/91	12,840	128	12,712	11,342	1,370
1995/96	14,230	142	14,088	12,740	1,348
2000/01	15,651	157	15,494	14,274	1,220
Maize (Seed)					
1985/86	98	5	93	112	-19
1990/91	117	6	111	126	-15
1995/96	136	7	129	142	-13
2000/01	157	8	149	159	-10
Groundnuts					
1985/86	538	161	377	469	-92
1990/91	632	190	442	525	-83
1995/96	764	229	535	590	-55
2000/01	933	280	653	661	-8
Sesame					
1985/86	145	15	130	187	-57
1990/91	165	17	148	210	-62
1995/96	183	18	165	236	-71
2000/01	206	21	185	264	-79
Pulses					
1985/86	386	39	347	375	-28
1990/91	427	43	384	420	-36
1995/96	470	47	423	472	-49
2000/01	516	52	464	529	-65
Jute					
1985/86	89	–	89	56	33
1990/91	111	–	111	63	48
1995/96	136	–	136	71	65
2000/01	163	–	163	79	84
Cotton					
1985/86	52	–	52	37	15
1990/91	58	–	58	42	16
1995/96	64	–	64	47	17
2000/01	71	–	71	53	18

IV. PROJECT EVALUATION

IV.1 Evaluation Criteria

Since the Master Plan for the Irrawaddy Basin Integrated Agri-
cultural Development involves many projects covering various sectors
such as agriculture, forestry, fisheries, animal husbandry and in-
frastructures, it seems rather difficult to evaluate such setoral
projects with consistency by a unified method, namely a benefit-cost
ratio, an internal rate of return, etc., because the identified pro-
jects are divided into two groups; the one is group of those project
whose benefit is tangible and the other is that of which benefit is
intangible.

For establishment of an evaluation criteria on the identified
projects, the following factors are taken into consideration.

- Availability of fundamental data and information
- Size of project cost
- Cost effectiveness
- Required implementation period
- Gestation period for benefit accrual
- Inter-sectoral balance
- Sub-regional balance
- Enthusiasm of local people
- Sequence of survey and study

IV.2 Economic Evaluation (I.R.R.)

1) General

Since the internal rate of return (I.R.R.) method can be applied
to those projects whose economic cost and benefit can be estimated
in monetary terms. Out of the identified projects mentioned in
Chapter VI.1. of Main Report, only the proposed irrigation projects
could be roughly evaluated by the I.R.R. method.

2) Price Analysis

For the I.R.R. computation, both project cost and benefit should be converted to economic ones from a national economic point of view. In this connection, prices of internationally traded goods are to be derived from the world market prices, and those of domestically traded goods can be estimated from on-going local market prices.

All prices to be applied to estimation of project cost and benefit, are based on 1979 price level. Table.K-4-1 summarizes farm gate prices of farm input and output. Back-up information on prices of internationally traded goods is compiled in Appendix K-2 of this Annex K.

3) Economic Project Cost

By applying the shadow exchange rate to the foreign currency portion of estimated project cost excluding a contingency for price escalation, the economic project cost for the proposed irrigation projects is calculated and shown in Table K-4-2. For an operation and maintenance cost of the irrigation project, 1.5 percent of the economic project cost is applied as shown in Table K-4-2. It is estimated that construction period of each irrigation project would be six years including necessary period for final design and preparation works.

4) Economic Project Benefit

An economic project benefit of the proposed irrigation project can be assessed at difference between economic net production values with and without project implementaion.

Table K-4-3 shows present cropping acreage in the proposed irrigation areas, which is a basis of estimating a net production value at present. Table K-4-4 gives the present net production value of the proposed irrigation projects.

TABLE K-4-1   FARM GATE PRICES

Item	Unit	Financial	Economic
Agricultural Commodity			
- Paddy	BKT/46 ℓbs	Ks 9	Ks 51
- Maize (Seeds)	BKT/5 ℓbs	Ks 20	Ks 20
- Groundnuts	BKT/25 ℓbs	Ks 47	Ks 47
- Sesame	BKT/54 ℓbs	Ks 158.5	Ks 158.5
- Matpe	BKT/72 ℓbs	Ks 50	Ks 108
- Jute	Viss/3.6 ℓbs	Ks 3.1	Ks 6.4
- Cotton	Viss/3.6 ℓbs	Ks 4.1	Ks 4.1
- Urea	Bag/56 ℓbs	Ks 12	Ks 64
- T.S.P.	Bag/112 ℓbs	Ks 67	Ks 171
- Muriate of Potash	Bag/112 ℓbs	Ks 34	Ks 96
- Pesticide	Gallon	Ks 230	Ks 438
- Herbicide	Gallon	Ks 116	Ks 207
Labor Wage			
- Farm Laborer	8 hours	Ks 8	Ks 5.3
- Draft Cattle	a pair-day	Ks 13	Ks 10
Other Items			
- Foreign Exchange Rate	per US$	Ks 6.44	Ks 13
- Land Tax			
Rain-fed Paddy Field	acre	Ks 2	-
Upland Field	acre	Ks 2	-
Gov't Irrigated Field	acre	Ks 6	-

TABLE K-4-2   PROJECT COST (ECONOMIC)
- Irrigation Project -

(Unit: Kyat thousand)

Name of Project	Irrigable Area (ha)	Economic Project Cost			Economic O&M Cost
		L.C.	F.C.	Total	
1. Wegyi	33,000	168,720	510,876	679,596	10,194
2. Taunyo	18,900	101,840	308,366	410,206	6,153
3. Bawbin	13,000	104,640	316,845	421,485	6,322
4. Gamon	4,500	58,120	175,984	234,104	3,512
5. Minhla	8,000	59,720	180,829	240,549	3,608
6. Kadinbilin	19,000	90,280	273,363	363,643	5,455
7. Thegaw	12,900	67,960	205,780	273,740	4,106
8. Thonze	39,500	167,720	507,848	675,568	10,134
9. Okkan	31,000	131,360	397,752	529,112	7,937
10. Nyangging	1,400	11,160	33,792	44,952	674
11. Buyo	4,900	44,520	134,804	179,324	2,690
12. Thaledan	2,500	15,480	46,873	62,353	935
13. Alonmoyak	8,000	65,880	199,481	265,361	3,980
14. North Kun	5,300	47,960	145,220	193,180	2,898
15. Phatshin	3,000	31,800	96,289	128,089	1,921
16. Mamya	8,500	124,040	375,587	499,627	7,494
17. Kyanin	16,400	118,840	359,842	478,682	7,180
18. Mankathu	16,700	131,800	399,084	530,884	7,963
19. Nankathu	20,000	194,280	588,270	782,550	11,738
20. Gyat	20,000	129,640	392,543	522,183	7,833
21. Mezili	19,000	121,720	368,562	490,282	7,354
22. South Kun	19,400	120,040	363,475	483,515	7,253
23. Kyetpaung	2,000	33,320	100,891	134,211	2,013

TABLE K-4-3 PRESENT CROPPING ACREAGE UNDER IRRIGATION PROJECT

Name of Project	Net Sown Area (ha)	Cropping Intensity (%)	Gross Sown Area (ha)	Paddy HYV (ha)	Paddy Others (ha)	Jute Pre-monsoon (ha)	Jute Monsoon (ha)	Groundnuts Rain (ha)	Groundnuts Winter (ha)	Sesame Early (ha)	Sesame Late (ha)	Pulses (ha)
1. Wegyi	33,000	107	35,310	1,589	25,000	35	1,624	106	953	459	247	5,297
2. Taunyo	18,900	107	20,223	910	14,318	20	930	61	546	263	142	3,033
3. Bawbin	13,000	107	13,910	626	9,847	14	640	42	376	181	97	2,087
4. Gamon	4,500	111	4,995	684	3,766	10	25	15	265	0	55	175
5. Minhla	8,000	111	8,880	1,216	6,695	18	44	27	471	0	98	311
6. Kadinbilin	19,000	111	21,090	2,889	15,903	42	105	63	1,118	0	232	738
7. Thegow	12,900	111	14,319	1,961	10,796	29	72	43	759	0	158	501
8. Thonze	39,500	111	43,956	6,022	33,142	88	220	132	2,330	0	484	1,538
9. Okkan	31,000	115	35,650	4,920	29,089	214	71	0	642	0	357	357
10. Nyangging	1,400	102	1,428	19	1,168	1	21	17	127	19	13	43
11. Buyo	4,900	102	4,998	65	4,088	5	75	60	445	65	45	150
12. Thaledan	2,500	102	2,550	33	2,085	3	38	31	227	33	23	77
13. Alonmoyak	8,000	.102	8,160	106	6,676	8	122	98	726	106	73	245
14. North Kun	5,300	102	5,406	70	4,423	5	81	65	481	70	49	162
15. Phatshin	3,000	102	3,060	40	2,502	3	46	37	272	40	28	92
16. Mamya	8,500	108	9,180	698	6,976	64	46	83	670	0	101	542
17. Kyanin	16,400	108	17,712	1,346	13,461	124	89	159	1,293	0	195	1,045
18. Mankathu	16,700	108	18,036	1,371	13,708	126	90	162	1,317	0	198	1,064
19. Nankathu	20,000	108	21,600	1,642	16,416	151	108	194	1,577	0	238	1,274
20. Gyat	20,000	108	21,600	1,642	16,416	151	108	194	1,577	0	238	1,274
21. Mezili	19,000	108	20,520	1,560	15,593	144	103	185	1,498	0	226	1,211
22. South Kun	19,400	108	20,952	1,592	15,924	147	105	189	1,529	0	230	1,236
23. Kyetpaung	2,000	108	2,160	164	1,642	15	11	19	158	0	24	127

TABLE K-4-4   NET PRODUCTION VALUE AT PRESENT

(Unit: Kyat thousand)

Name of Project	Paddy		Jute		Groundnuts		Sesame		Pulses	Total
	HYV	Others	Pre-monsoon	Monsoon	Rain	Winter	Early	Late		
1. Wegyi	10,092	92,675	51	1,656	10	751	243	150	1,865	107,093
2. Taunyo	5,779	52,848	29	949	6	430	139	86	1,068	61,334
3. Bawbin	3,976	36,345	21	653	4	296	96	59	735	42,185
4. Gamon	4,344	13,900	15	26	1	209	0	33	62	18,590
5. Minhla	7,723	24,711	26	45	3	371	0	60	109	33,048
6. Kadinbilin	18,348	58,698	62	107	6	881	0	141	260	78,503
7. Thegaw	12,454	39,848	43	73	4	598	0	96	176	53,292
8. Thonze	38,246	122,327	129	224	13	1,836	0	294	541	163,610
9. Okkan	31,247	107,367	314	72	0	506	0	217	126	139,849
10. Nyangging	121	4,311	1	21	2	100	10	8	15	4,589
11. Buyo	413	15,089	7	77	6	351	34	27	53	16,057
12. Thaledan	210	7,696	4	39	3	179	17	14	27	8,189
13. Alonmoyak	673	24,641	12	124	10	572	56	44	86	26,218
14. North Kun	445	16,325	7	83	6	379	37	30	57	17,369
15. Phatshin	254	9,235	4	47	4	214	21	17	32	9,828
16. Mamya	4,433	25,748	94	47	8	528	0	61	191	31,110
17. Kyanin	8,548	49,685	182	91	16	1,014	0	119	368	60,028
18. Mankathu	8,707	50,596	185	92	16	1,038	0	120	375	61,129
19. Nankathu	10,428	60,591	221	110	19	1,243	0	145	448	73,205
20. Gyat	10,428	60,591	221	110	19	1,243	0	145	448	73,205
21. Mezili	9,908	57,554	211	105	18	1,180	0	137	426	69,539
22. South Kun	10,111	58,775	216	107	19	1,205	0	140	435	71,008
23. Kyetpaung	1,042	6,061	22	11	2	125	0	15	45	7,323

A proposed cropping acreage and net production value per hectare of the irrigable area are estimated as follows;

PROPOSED CROPPING ACREAGE AND N.P.V.

Net Area Sown   :   1 ha
Cropping Intensity: 168 %
Gross Area Sown   :   1.68 ha

	Cropped Area (ha)	NPV/ha (Ks)	NPV (Ks)
Wet			
Paddy (HYV)	1.00	9,485	9,485
Dry			
Paddy (HYV)	0.09	10,683	961
Groundnuts (Winter)	0.19	3,490	663
Sesame (Late)	0.19	3,085	586
Pulses	0.21	1,534	322
Total	**1.68**	–	**12,017**

Net production value of selected crops are compiled in Appendix K-3 of this Annex K.

Table K-4-5 indicates an incremental net production value of the proposed irrigation projects which is called as a project benefit (Economic).

5) Internal Rate of Return

Taking into consideration that a gestation period for full benefit accrual would be five years after completion of construction works, an internal rate of return of the proposed irrigation projects is separately estimated by computing present worth value of both economic cost and benefit at different discount rates. The result is shown in Table K-4-6, and details of I.R.R. computation are given

TABLE K-4-5 PROJECT BENEFIT
    - Irrigation Project--

(Unit: Kyat thousand)

Name of Project	Irrigable Area (ha)	N.P.V. w/o Project	N.P.V. with Project	Incremental N.P.V.
1. Negyi	33,000	107,093	396,660	289,567
2. Taunyo	18,900	61,334	227,178	165,844
3. Bawbin	13,000	42,185	156,260	114,075
4. Gamon	4,500	18,590	54,090	35,500
5. Minhla	8,000	33,048	96,160	63,112
6. Kadinbilin	19,000	78,503	228,380	149,877
7. Thegaw	12,900	53,292	155,058	101,766
8. Thonze	39,500	163,610	474,790	311,180
9. Okkan	31,000	139,849	372,620	232,771
10. Nyangging	1,400	4,589	16,828	12,239
11. Buyo	4,900	16,057	58,898	42,841
12. Thaledan	2,500	8,189	30,050	21,861
13. Alonmoyak	8,000	26,218	96,160	69,942
14. North Kun	5,300	17,369	63,706	46,337
15. Phatshin	3,000	9,828	36,060	26,232
16. Mamya	8,500	31,110	102,170	71,060
17. Kyanin	16,400	60,028	197,128	137,100
18. Mankathu	16,700	61,129	200,734	139,605
19. Nankathu	20,000	73,205	240,400	167,195
20. Gyat	20,000 ·	73,205	240,400	167,195
21. Mezili	19,000	69,539	228,380	158,841
22. South Kun	19,400	71,008	233,188	162,180
23. Kyetpaung	2,000	7,323	24,040 .	16,717

TABLE K-4-6 ECONOMIC EVALUATION OF IRRIGATION PROJECTS

Name of Project	Irrigable Area (ha)	I.R.R. (%)	Present Worth Value (at 10%) - -Kyat million- -		
			Benefit	Cost	NPWV[1]/
1. Wegyi	33,000	19.45	1,328	530	798
2. Taunyo	18,900	18.86	761	320	441
3. Bawbin	13,000	14.44	523	329	194
4. Gamon	4,500	9.25	163	183	-20
5. Minhla	8,000	14.16	290	188	102
6. Kadinbilin	19,000	10.09	688	283	405
7. Thegaw	12,900	17.80	467	213	254
8. Thonze	39,500	20.37	1,427	527	900
9. Okkan	31,000	19.79	1,068	412	656
10. Nyangging	1,400	14.49	56	35	21
11. Buyo	4,900	13.21	197	140	57
12. Thaledan	2,500	17.16	100	49	51
13. Alonmoyak	8,000	14.20	321	207	114
14. North Kun	5,300	13.25	213	151	62
15. Phatshin	3,000	11.80	120	100	20
16. Mamya	8,500	8.76	326	389	-63
17. Kyanin	16,400	14.92	629	373	256
18. Mankathu	16,700	14.18	640	414	226
19. Nankathu	20,000	12.13	767	610	157
20. Gyat	20,000	16.23	767	407	360
21. Mezili	19,000	16.36	729	382	347
22. South Kun	19,400	16.72	744	377	367
23. Kyetpaung	2,900	7.54	77	105	-28

Note: 1/ Net Present Worth Value

in Appendix K-5 of this Annex 5.

Table K-4-7 indicates the evaluation result of the irrigation component of the identified projects, of which details are compiled in Annex K-6.

IV.3. Priority

In order to determine priority of the identified projects in the Master Plan, the nine factors for evaluation criteria as mentioned in IV.1. of this chapter, are arbitrarily given a respective weight, and contents of each factors are tentatively assessed by a ten-mark method, which could be changed by a decision maker from time to time. The criteria to be applied in this report is given in Table K-4-8.

According to the said evaluation criteria, Table K-4-9 shows results on evaluation of the identified projects.

IV.4. Financial Consideration

A financial analysis on farmers' economy has been roughly made. Table K-4-10 shows block-wise cropping acreages at present and in future. Without any consideration that farmers may have opportunity for them to sell their farm products in free markets, Table K-4-11 gives an incremental net farm income to be obtainable from only crop cultivation. Net farm income per acre of selected crops is compiled in Appendix K-7 of this Annex K.

TABLE K-4-7 · ECONOMIC EVALUATION OF IDENTIFIED PROJECT (IRRIGATION)

Name of Identified Project	Reservoir Involved	Irrigable Area (ha)	Implementation Period (year)	Gestation Period (year)	I.R.R. (%)	Present Worth Value [1]/ [2]/ ---million Kyat---		
						Benefit	Cost	NPWV[2]/
1. West Pegu Yoma I	Kadinbilin, Thegaw, Thonze, Okkan	102,400	10	3	17.27	2,685	1,174	1,511
2. West Pegu Yoma II	Wegyi, Taunyo	51,900	8	4	17.37	1,733	768	965
3. West Pegu Yoma III	Bawbin, Gamon, Minhla	25,500	6	5	13.13	976	699	277
4. East Arakan Yoma I	Mamya, Kyanin, Mankathu	61,600	10	3	11.60	1,741	1,460	281
5. East Arakan Yoma II	Alonmoyak, North Kun, Phatshin	16,300	6	5	13.39	654	457	197
6. East Arakan Yoma III	Gyat, Mezili, South Kun, Kyetpaung	80,400	10	3	14.27	1,704	1,039	665
7. East Arakan Yoma IV	Nyangging, Buyo, Thaledan	8,800	6	5	14.37	353	223	130

Note: 1/ at 10% discount rate, 2/ Net Present Worth Value

TABLE K-4-8   EVALUATION CRITERIA

Factor	Weight	Contents	Mark
A. Data Availability	10%	Existence	10
		Under Preparation	5
		Absence	0
B. Size of Project Cost (Unit:Kyat million)	20%	0 - 10	10
		11 - 100	7.5
		101 - 500	5
		501 and over	2.5
C. Cost Effectiveness	15%	High	10
		Medium	6
		Low	3
D. Required Implementation Period (year)	15%	0 - 1	10
		2 - 3	8
		4 - 5	6
		6 - 10	4
		11 and over	2
E. Gestation Period for Benefit Accrual (year)	10%	0 - 1	10
		2 - 3	7.5
		4 - 5	5
		6 and over	2.5
F. Inter-Sectoral Balance (Sector covered)	5%	1	3
		2	6
		3 and over	10
G. Inter-Regional Balance (Block covered)	5%	1	3
		2 - 3	6
		4 and over	10
H. Enthusiasm of Local People	10%	High	10
		Medium	6
		Low	3
I. Sequence of Survey and Study	10%	Primary	10
		Secondary	6
		Tertiary & further	3

TABLE K-4-9. EVALUATION OF IDENTIFIED PROJECTS

Code	Name of Project	A	B	C	D	E	F	G	H	I	Weighted Total
A-1	Arrangement of Maps	10	7.5	10	6	10	10	10	10	10	8.9
B-1	Soil Survey	0	10	6	8	10	10	10	6	6	7.3
B-2	Regional Experimental Farm	5	7.5	6	6	7.5	3	6	6	6	6.2
B-3	Seed Farm Improvement	5	10	6	8	7.5	3	3	6	6	6.85
B-4	State Farm	5	7.5	3	6	5	6	6	6	3	5.35
B-5	Whole Township Paddy Production Supporting	10	2.5	10	6	10	3	10	10	10	7.55
C-1	Model Nursery	5	10	6	10	10	3	3	10	3	7.5
C-2	Pilot Plantation	5	n.a.	10	10	2.5	3	10	10	6	n.a.
C-3	Forest Plantation	5	5	6	6	2.5	3	10	10	6	5.8
C-4	Industrial Plantation	5	n.a.	6	n.a.	2.5	3	10	6	3	n.a.
D-1	Introduction of Grass Carp Spawns	5	10	6	10	7.5	3	3	10	10	7.95
E-1	Feed Mill Plant	10	7.5	10	6	7.5	3	3	10	10	7.95
E-2	Pasture Land Development	10	10	6	8	7.5	3	3	10	6	7.75

TABLE K-4-9   EVALUATION OF IDENTIFIED PROJECTS (Cont'd)

Code	Name of Project	A	B	C	D	E	F	G	H	I	Weighted Total
E-3	Pig & Poultry Breeding Centre	5	10	6	8	7.5	3	3	6	6	6.85
E-4	Cattle Breeding Centre	5	10	6	8	7.5	3	3	6	6	6.85
E-5	Slaughter House Rehabilitation	5	7.5	6	6	7.5	3	3	6	6	6.05
E-6	Silage Supply	5	2.5	3	2	2.5	3	10	10	3	3.95
F-a-1	Pilot Land Consolidation	10	5	10	2	10	6	10	10	10	7.6
F-a-2	West Pegu Yoma Irrig. I	10	2.5	10	4	7.5	6	.6	10	6	6.55
F-a-3	West Pegu Yoma Irrig. II	5	7.5	.6	4	5	6	3	6	6	5.65
F-a-4	West Pegu Yoma Irrig. III	5	7.5	6	4	5	6	3	6	6	5.65
F-a-5	East Arakan Yoma Irrig. I	0	2.5	6	4	5	6	3	3	6	3.85
F-a-6	East Arakan Yoma Irrig. II	0	5	6	4	5	6	3	3	6	4.35
F-a-7	East Arakan Yoma Irrig. III	0	2.5	6	4	5	6	3	3	6	3.85
F-a-8	East Arakan Yoma Irrig. IV	0	5	6	4	5	6	3	3	6	4.35
F-b-1	Swamp Reclamation	5	7.5	6	2	5	6	6	6	3	5.2
F-b-2	Flood Interception	5	2.5	10	4	5	6	6	6	3	5.1
F-c-1	Rural Road Network	0	2.5	3	2	10	10	10	3	3	3.85
F-c-2	Rural Development	5	5	6	2	10	10	10	3	3	5.3
F-d-1	Hydro-Power Generation	--------See Code F-a-2 to F-a-8.									