

Feasibility Study for 6,000
Low Cost Housing Units

I. Objectives

The present report attempts to evaluate project cost alternatives which are considered economically and socially feasible.

Out of such outcomes questions regarding allocation of houses among the various sizes and/or types and income groups; and loan terms, i.e. down payment, maturity periods and interest rates to be charged, and income shares, are expected to be answered.

In evaluation of the above cost alternatives, eligibility of the beneficiaries to the various house sizes is sought, given the ranges of the different elements that make up the loan term.

Interest rates take the values of 8%, 8.5%, 9%, 9.5%, 10%.

Income shares take the values of 20%, 25%, 30%, 35%.

Maturity period range extends from 15 years to 30 years with 5 years difference between periods.

¹Break even point is the point where loan affordable is equal to loan needed. (Only in the case of project with no initial down payment, loan affordable is equated with house cost).

II. Efficient Allocation

Eligibility of beneficiaries to the program is identified at break even points of loan affordable by income and loans needed by house sizes and/or types. Loan affordable referred to in Annex C represents the present value (P) of the sum of installments paid by the beneficiaries over the maturity period (n) of the loan needed, discounted by the interest rate (i) charged, after allowing for a 5% yearly increase (r) in income and one year grace period on the principal loan.²

Since maturity periods are not considered in terms of a range, break even points are approximated to be within certain limits depending on the category of the project under consideration. e.g. for a project with levelled down payment, limits are taken to be within $\pm 1,000$ or $\pm 1,200$ below or above loan needed depending on construction cost.³

²Formula used to calculate affordable loans is:

$$P = \frac{Ya(1+r)}{(1-r)} \frac{(1+i)^{n-1} - (1+r)^{n-1}}{(1+i)^n}$$

Y : Income group a : Income share allocated to housing.

³Limits set represent difference between loans needed of consecutive house sizes and/or types divided by 2.

Such break even points represent the most efficient allocation of affordable loans to the various house sizes. The combination of break even points associated with any set of loan terms agreed upon, show us in the final analysis what house size and/or type can be built, i.e. what can be supplied, and the corresponding income groups being catered for. Assuming that loan terms, i.e. interest rate, maturity period, income share allocated to housing, were to be standardized for all income groups equally, such allocation of houses by income group and size is represented by curves shown in Annex C, and referred to as house sets in annex D.

III. Project Cost Alternatives

Annex D classifies projects into three categories that are:

1. Project with no initial down payment: assuming the down payment is spread over the maturity period of the loan and is accounted for by a percentage over and above yearly income share allocated to housing and it is taken to be 35%.
2. Project cost with progressive down payment: starting with 7.5% down payment for LL.5,000/year income group going up to 25% of house cost for LL.12,000/year

where 15% is allocated to each of the house sizes and income groups at the limits given by the set, and 70% is allocated to the middle size house and corresponding income group.

As for the subsidies appearing in Annex D along with the project costs, they are the result of interest rate differentials, as most interest rates considered are subsidized. These subsidies are calculated by evaluating the cost of the project, associated with the selected house set, at the effective cost of capital to the government, approximated to be at 10.5%, taking into account the timing of withdrawals by the government from the lender, of repayments (including grace period as well as time of accruals of commissions) as stipulated in the agreement with the lender.

It is worth noting that the project cost calculated do not take into consideration the opportunity cost to the government of investing in the present project, and the increase in the borrowing power required, that varies directly with maturity periods.

IV. Optimization

The house sets considered represent, as mentioned earlier in the report, the most efficient allocation of

affordable loans among the various house sizes and/or types, but do not necessarily represent the optimal combinations. Optimal combinations are considered to be those that have maximum representation of income groups (i.e. those combinations that allow most of the income groups to get at least one house under the present program), and the best variety of house sizes with least cost possible in terms of loan needed and subsidy.

The selection considered in Annex D₂ are one step in this direction. By looking at the three project categories we notice that least subsidies are incurred at 10% interest rate, where projects with levelled down payment require the least subsidies, and loans needed, followed by the projects with progressive down payment, and projects with no initial down payment respectively. In addition, the project with levelled down payment offer more possibilities for reaching the lowest income groups, e.g. 2 possibilities for reaching LL.6,000/year income group which are at 30% share of income over 25 years and 30 years, as compared with one possibility with no initial down payment project at 30% share of income over 30 years, and none when it comes to project with progressive down payment. When comparing possibilities with similar loan terms of the two former projects, the levelled down payment project is opted

for as the no initial down payment project requires LL.240 million loan, and LL.16 million subsidy as compared with LL.200 million loan and LL.12 million subsidy for the levelled down payment project.

By elimination, the levelled down payment project is opted for, and choices are restricted to project costs alternatives at 10% rate of interest, such costs correspond to different house sets and beneficiaries. By looking at Annex D₂ we see that the group of beneficiaries vary with the house set under consideration. Moving rightward to higher maturity periods the house set shifts downward in favor of the lower income brackets reaching the limit to lowest income group possible at 30 years maturity period. In the process, higher income groups within our range are dropped out not because of affordability, but due to rigidity of loan terms.

For a better comparison of project costs Annex D₂ is reproduced, for levelled down payment at 10% interest rate, into Annex D₃ where downward flexibility in maturity is allowed, in certain cases, to reach the highest income group ceiling. The number of break even points at the bottom of the vertical columns and at the right of the horizontal columns (Annex C) shows the maximum limit to eligibility to the program by house size and by income group

respectively, if full flexibility is to be allowed in income shares (table 26), in interest rates (table 42), in maturity periods (table 70).

Depending on the lowest income group limit, we are trying to reach Annex D₃ presents us with the various options from which the optimal choice could be made. Table 1 (Annex D₃) considers income groups between LL.6,000/year to LL.12,000/year, where optimal choice recommended is for a loan of LL.200.4 millions over a maturity period of 25 years at 10% rate of interest and 30% income share allocated to housing, with a subsidy of LL.7.5 millions.

This is a first rough approximation for an optimal choice combination. To be able to reach a final decision regarding the said choice, final answers with respect to house costs and designs need to be reached, on the supply side. On the demand side, lowest ceiling of income groups should be defined, and distribution regarding house allocation among the various income groups should be answered from applications of the respective income group i.e. beneficiaries.

Recommended standardizing loan terms with the lender at 10% interest rate, 30% income share, and 25 years maturity period for a low income group ceiling of LL.6,000/year,

and 20 years maturity period for LL.7,000/year and LL.8,000/year low income group ceilings. Downward flexibility in maturity periods as our upper limits, is recommended for beneficiaries. In addition to improving cash flow situation, clearly shown by successive curves in Annex C corresponding to different maturity periods (table 70), such policy is expected to minimize subsidy, provided an optimal choice in house design is achieved and a careful house allocation among income groups is made, if replicability is the target in our program.

D.K.

September 25, 1978

How can various income levels be served?

- a) Incomes at 6000 can be served if a 30 year repayment period for this group is adopted. See Tables 5 and 6. They will need a capital subsidy or accept a house with less than 70 m²
- b) Incomes at 8000 can be served with either a 20 or a 25 or a 30 year repayment period (see Tables 2, 4, 5, 6). With a 20 year repayment period, they require an interest subsidy and have to pay 30% of their income.
- c) Incomes at 10,000 and 12,000 can be served with either 20, 25, or 30 year repayment period.

Is there any special risk for the government with 30 year repayment periods?

Yes, because during the first 10 years or so payments are not sufficient to cover interest. The government would have to borrow to cover the interest deficit.

TABLE 1

MAXIMUM LOAN AFFORDABLE
IF REPAYED OVER 20 YEARS
AT 25% OF INCOME

Income* of Borrower	Interest Rate on Loan		
	8%	9%	10%
6000	21,546	19,746	18,168
8000	28,729	26,328	24,224
10,000	35,911	32,911	30,280
12,000	43,093	39,493	36,336

Note: If $75m^2$ is the smallest acceptable unit, only incomes at 12,000 qualify for housing at LL.500/m²
(500 x 75 = LL 37,500)

TABLE 2

MAXIMUM LOAN AFFORDABLE
IF REPAYED OVER 20 YEARS
AT 30% OF INCOME

Income* of Borrower	Interest Rate on Loan		
	8%	9%	10%
6000	28,728	26,328	24,224
8000	38,305	35,109	32,302
10,000	47,876	43,876	40,369
12,000	57,457	52,657	48,448

Note: If $75m^2$ is the smallest acceptable unit, only incomes at 8,000 and over qualify for housing at LL.500 per m²

* Incomes are assumed to increase at a rate of 5% each year

TABLE 3

MAXIMUM LOAN AFFORDABLE
IF REPAID OVER 25 YEARS
AT 25% OF INCOME

Income* of Borrower	Interest Rate on Loan		
	8%	9%	10%
6000	25,276	22,773	20,745
8000	33,702	30,729	27,498
10,000	42,127	37,955	34,745
12,000	50,553	45,547	41,745

Note: If 75m² is the smallest acceptable unit, only income at 10,000 and over qualify for housing at LL.500 per m²

TABLE 4

MAXIMUM LOAN AFFORDABLE
IF REPAID OVER 25 YEARS
AT 30% OF INCOME

Income* of Borrower	Interest Rate on Loan		
	8%	9%	10%
6000	33,330	27,324	24,750
8000	40,440	36,432	33,000
10000	50,550	45,540	41,250
12000	60,660	54,648	44,500

Note: If 75m² is the smallest acceptable unit incomes at 8000 and over qualify for housing at LL.500 per m²

* Incomes are assumed to increase at the rate of 5% per year

TABLE 5

MAXIMUM LOAN AFFORDABLE
IF REPAID OVER 30 YEARS
AT 25% OF INCOME

Income* of Borrower	Interest Rate on Loan		
	8%	9%	10%
6000	28,525	25,284	22,569
8000	38,033	33,713	30,092
10,000	47,541	42,141	37,616
12,000	57,049	50,569	45,139

Note: If 75m² is the smallest acceptable unit, incomes at 8000 and over qualify for housing at LL.500 per m² (Incomes at 8000 qualify only if interest is 8%)

TABLE 6

MAXIMUM LOAN AFFORDABLE
IF REPAID OVER 30 YEARS
AT 30% OF INCOME

Income* of Borrower	Interest Rate on Loan		
	8%	9%	10%
6000	34,224	30,341	27,083
8000	45,639	40,000	36,111
10,000	57,049	50,569	45,139
12,000	68,959	60,683	54,166

Note: If 75m² is the smallest acceptable unit, incomes at 8000 and over qualify for housing at LL.500 per m²

* Incomes are assumed to increase at a rate of 5% each year

TABLE 7

MONTHLY PAYMENTS IN FIRST YEAR
(same for all loan periods and interest rates)

Income of Borrower	<u>Share of Income for Houses</u>	
	25%	30%
6000	125	150
8000	167	200
10,000	208	250
12,000	250	300

Annex C.

Table 26

LOANS AFFORDABLE, LOANS NEEDED (HOUSE COSTS), AND DIFFERENCES BETWEEN THEM IF LOANS WERE TO BE REPAYED AT 10.0 PERCENT INTEREST RATE OVER 30 YEARS

1-LOAN AFFORDABLE WITH NO GRACE PERIOD
 2-LOAN AFFORDABLE WITH 1 YEAR GRACE PERIOD
 3-FOR BREAK-EVEN POINT (WITHIN -1250 AND 1250)

NO DOWN PAYMENT

HOUSE SIZES IN SQ. METERS		HOUSE COST AT 500 L.L./SQ.M. L.L. 30000												
		50	55	60	65	70	75	80	85	90	95	100		
		L.L. 30000	L.L. 32500	L.L. 35000	L.L. 37500	L.L. 40000	L.L. 42500	L.L. 45000	L.L. 47500	L.L. 50000	L.L. 52500	L.L. 55000		
INCOME GROUP	INCOME SHARE L./YEAR	LOAN AFFORDABLE		DIFF.										
		P1	P2	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	
5000		0.20	15046	14137	-13653	-13363	-20863	-23363	-25863	-23363	-30653	-33653	-35863	
		0.25	18808	17672	-12326	-14828	-17328	-19828	-22328	-24828	-27328	-29828	-32328	
		0.30	22570	21206	-8794	-11294	-13794	-16294	-18794	-21294	-23794	-26294	-28794	
		0.35	26331	24740	-5260	-7760	-10260	-12760	-15260	-17760	-20260	-22760	-25260	
6000		0.20	18056	16955	-13035	-15535	-18035	-20535	-23035	-25535	-28035	-30535	-33035	
		0.25	22569	21206	-8794	-11294	-13794	-16294	-18794	-21294	-23794	-26294	-28794	
		0.30	27083	25447	-4553	-7053	-9553	-12053	-14553	-17053	-19553	-22053	-24553	
		0.35	31597	29538	-312**	-2812	-5312	-7812	-10312	-12812	-15312	-17812	-20312	
7000		0.20	21055	19792	-10208	-12708	-15208	-17708	-20208	-22708	-25208	-27708	-30208	
		0.25	26331	24740	-5260	-7760	-10260	-12760	-15260	-17760	-20260	-22760	-25260	
		0.30	31597	29588	-312**	-2312	-5312	-7812	-10312	-12812	-15312	-17812	-20312	
		0.35	36864	34636	4636	-2136	-4636**	-7136	-9636	-12136	-14636	-17136	-19636	
8000		0.20	24074	22620	-7380	-9380	-12380	-14380	-17380	-19380	-22380	-24380	-27380	
		0.25	30093	28275	-1725	-4225	-6725	-9225	-11725	-14225	-16725	-19225	-21725	
		0.30	36111	33929	3929	1429	-1071**	-3571	-6071	-8571	-11071	-13571	-16071	
		0.35	42130	39584	9584	7084	4584	2084	-416**	-2916	-5416	-7916	-10416	
9000		0.20	27083	25447	-4553	-7053	-9553	-12053	-14553	-17053	-19553	-22053	-24553	
		0.25	33854	31309	1809	-691**	-3191	-5691	-8191	-10691	-13191	-15691	-18191	
		0.30	40625	38171	3171	5571	3171	671**	-1329	-4329	-9329	-14329	-19329	
		0.35	47396	44532	14532	12032	9532	7032	4532	2032	-463**	-2132	-5432	
10000		0.20	30093	28275	-1725	-4225	-6725	-9225	-11725	-14225	-16725	-19225	-21725	
		0.25	37616	35333	5333	2333	333**	-2157	-4657	-7157	-9657	-12157	-14657	
		0.30	45139	42412	12412	9912	7412	4912	2412	-33**	-2563	-5063	-7563	
		0.35	52662	49480	19480	16780	14480	11980	9480	6980	4480	1980	-5280**	
11000		0.20	33102	31102	1132**	-1393	-3693	-6393	-8693	-11393	-14093	-16793	-19493	
		0.25	41377	38377	8577	5377	3877	1377	-1123**	-3523	-5823	-8123	-10423	
		0.30	49653	46653	16653	14153	11653	9153	6653	4153	1653	-947**	-5547	
		0.35	57928	54428	24428	21928	19428	16928	14428	11928	9428	6928	4428	
12000		0.20	36111	33929	3929	1429	-1071**	-3571	-6071	-8571	-11071	-13571	-16071	
		0.25	45139	42412	12412	9912	7412	4912	2412	-33**	-2563	-5063	-7563	
		0.30	54167	50894	20894	18394	15894	13394	10894	8394	5894	3394	816**	
		0.35	63194	59376	29376	26876	24376	21876	19376	16876	14376	11876	9376	

note that LL 6000 per year to LL 12000 per year income groups can at least one house under the present program.

Table 42
LOANS AFFORDABLE, LOANS NEEDED FOR THE CONSTRUCTION OF HOUSES
AND DIFFERENCES BETWEEN THEM IF LOANS WERE TO BE REPAYED OVER 30 YEARS
WITH 30 PERCENT OF INCOME ALLOCATED TO HOUSING

P1-LOAN AFFORDABLE WITH NO GRACE PERIOD		PROGRESSIVE DOWNPAYMENT (AS A PERCENT OF HOUSE COST)									
P2-LOAN AFFORDABLE WITH 1 YEAR GRACE PERIOD		60	65	70	75	80	85	90	95	100	
HOUSE SIZES IN SQ. METERS		60	65	70	75	80	85	90	95	100	
HOUSE COST AT 500 L.L./SQ.M.		L.L. 30000	L.L. 32500	L.L. 35000	L.L. 37500	L.L. 40000	L.L. 42500	L.L. 45000	L.L. 47500	L.L. 50000	
INCOME GROUP L.L./YEAR	INTEREST RATE	LOAN AFFORDABLE		DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.
		P1	P2								
5000	LOAN NEEDED	L.L. 27750	L.L. 30062	L.L. 32375	L.L. 34687	L.L. 37000	L.L. 39312	L.L. 41625	L.L. 43937	L.L. 46250	
	**FOR BREAKEVEN POINT (WITHIN-1135 AND 1135)										
	0.080	28525	27136	-613**	-2925	-9353	-12175	-14488	-16800	-19113	
	0.085	26332	25449	-2300	-4612	-9237	-11550	-13862	-16175	-18487	
	0.090	25284	23908	-3341	-6153	-10778	-13091	-15403	-17715	-20028	
	0.095	23868	22498	-5291	-7553	-12138	-14501	-16813	-19125	-21438	
	0.100	22570	21206	-6543	-8855	-13480	-15793	-18105	-20418	-22730	
	0.105	21377	20020	-7729	-10041	-14666	-16979	-19291	-21604	-23916	
	0.110	20280	18929	-8620	-11132	-15757	-18070	-20382	-22695	-25007	
6000	LOAN NEEDED	L.L. 27000	L.L. 29250	L.L. 31500	L.L. 33750	L.L. 36000	L.L. 38250	L.L. 40500	L.L. 42750	L.L. 45000	
	**FOR BREAKEVEN POINT (WITHIN-1125 AND 1125)										
	0.080	34230	32563	5563	3313	1053**	-1136	-3436	-5686	-7936	-10186
	0.085	32198	30539	3539	1249	-760**	-3210	-5460	-7710	-9960	-12210
	0.090	30341	28690	1690	-559**	-2809	-5059	-7309	-9559	-11809	-14059
	0.095	28642	26998	-1**	-2251	-4501	-6751	-9001	-11251	-13501	-15751
	0.100	27083	25447	-1552	-3802	-6052	-8302	-10552	-12802	-15052	-17302
	0.105	25652	24023	-2976	-5226	-7476	-9726	-11976	-14226	-16476	-18726
	0.110	24336	22715	-4234	-6534	-8734	-11034	-13284	-15534	-17784	-20034
7000	LOAN NEEDED	L.L. 26250	L.L. 28437	L.L. 30625	L.L. 32812	L.L. 35000	L.L. 37187	L.L. 39375	L.L. 41562	L.L. 43750	
	**FOR BREAKEVEN POINT (WITHIN-1093 AND 1093)										
	0.080	33935	37591	11741	9554	7366	5179	2991	80+**	-1333	-3570
	0.085	37564	35629	3379	7192	5034	2817	629**	-1557	-3745	-5932
	0.090	35398	33472	7222	5035	2347	660**	-1527	-3714	-5902	-8089
	0.095	33415	31498	5248	3061	873**	-1315	-3501	-5638	-7775	-9913
	0.100	31597	29686	3438	1251	-936**	-3123	-5311	-7498	-9686	-11873
	0.105	29923	28027	1777	-409**	-2597	-4734	-6872	-9059	-11347	-13534
	0.110	28392	26500	250**	-1936	-4124	-6311	-8499	-10686	-12874	-15061
8000	LOAN NEEDED	L.L. 25500	L.L. 27625	L.L. 29750	L.L. 31875	L.L. 34000	L.L. 36125	L.L. 38250	L.L. 40375	L.L. 42500	
	**FOR BREAKEVEN POINT (WITHIN-1062 AND 1062)										
	0.080	45640	43418	17918	15793	13668	11543	9418	7293	5168	3043
	0.085	42931	40719	15219	13094	10969	8844	6719	4594	2469	34+**
	0.090	40455	38253	12753	10628	8503	6378	4253	2128	5**	-2121
	0.095	38189	35957	10497	8372	6247	4122	1997	-127**	-2252	-4377
	0.100	36111	33929	6429	6304	4179	2054	-70**	-2195	-4320	-6445
	0.105	34203	32031	6531	4406	2231	156**	-1968	-4093	-6213	-8343
	0.110	32448	30236	4786	2661	535**	-1538	-3713	-5833	-7953	-10063

(LL 7000 per year to)

note that all income groups can get at least one house under the present program, but only LL 12000 per year income groups get these houses at the cost of capital (i.e. non subsidized interest rate).

Table 70

LOANS AFFORDABLE, LOANS NEEDED FOR THE CONSTRUCTION OF HOUSES AND DIFFERENCES BETWEEN THEM IF LOANS WERE TO BE REPAYED AT 10.0 PERCENT INTEREST RATE WITH 30 PERCENT OF INCOME ALLOCATED TO HOUSING

ANNEX C (Continued)

LEVELED DOWNPAYMENT (20 PERCENT OF HOUSE COST)

P1-LOAN AFFORDABLE WITH NO GRACE PERIOD

P2-LOAN AFFORDABLE WITH 1 YEAR GRACE PERIOD

** - FOR BREAK-EVEN POINT (WITHIN -1000 AND 1000)

HOUSE SIZES IN SQ. METERS	60	65	70	75	80	85	90	95	100	No. of houses sizes and/or types by income group		
HOUSE COST AT 500 L.L./SQ.M.	L.L. 30000	L.L. 32500	L.L. 35000	L.L. 37500	L.L. 40000	L.L. 42500	L.L. 45000	L.L. 47500	L.L. 50000			
LOAN NEEDED	L.L. 24000	L.L. 26000	L.L. 28000	L.L. 30000	L.L. 32000	L.L. 34000	L.L. 36000	L.L. 38000	L.L. 40000			
INCOME GROUP	MATURITY PERIOD	LOAN AFFORDABLE	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.	DIFF.		
L.L./YEAR	YEARS	P1 P2										
5000	15	15070 13706	-10294	-12294	-14294	-16294	-18294	-20294	-22294	-24294	-26294	
	20	18168 16805	-7195	-9195	-11195	-13195	-15195	-17195	-19195	-21195	-23195	
	25	20624 19260	-4740	-6740	-8740	-10740	-12740	-14740	-16740	-18740	-20740	
	30	22570 21206	-2794	-4794	-6794	-8794	-10794	-12794	-14794	-16794	-18794	
6000	15	18084 16447	-7553	-9553	-11553	-13553	-15553	-17553	-19553	-21553	-23553	
	20	21802 20165	-3835	-5835	-7835	-9835	-11835	-13835	-15835	-17835	-19835	
	25	24748 23112	-888**	-2888	-4888	-6888	-8888	-10888	-12888	-14888	-16888	
	30	27083 25447	1447	-553**	-2553	-4553	-6553	-8553	-10553	-12553	-14553	2
7000	15	21098 19188	-4812	-6812	-8812	-10812	-12812	-14812	-16812	-18812	-20812	
	20	25435 23526	-474**	-2474	-4474	-6474	-8474	-10474	-12474	-14474	-16474	
	25	28873 26964	2964	964**	-1036	-3036	-5036	-7036	-9036	-11036	-13036	
	30	31597 29688	5688	3688	1688	-312**	-2312	-4312	-6312	-8312	-10312	3
8000	15	24111 21930	-2070	-4070	-6070	-8070	-10070	-12070	-14070	-16070	-18070	
	20	29069 26887	2887	887**	-1113	-3113	-5113	-7113	-9113	-11113	-13113	
	25	32998 30816	6816	4816	2816	816**	-1184	-3184	-5184	-7184	-9184	
	30	36111 33929	9929	7929	5929	3929	1929	-71**	-2071	-4071	-6071	3
9000	15	27125 24671	671**	-1329	-3329	-5329	-7329	-9329	-11329	-13329	-15329	
	20	32703 30248	6248	4248	2248	248**	-1752	-3752	-5752	-7752	-9752	
	25	37123 34668	10668	8668	6668	4668	2668	668**	-1332	-3332	-5332	
	30	40625 38171	14171	12171	10171	8171	6171	4171	2171	171**	-1329	4
10000	15	30139 27412	3412	1412	-588**	-2588	-4588	-6588	-8588	-10588	-12588	
	20	36336 33609	9609	7609	5609	3609	1609	-391**	-391	-4391	-6391	
	25	41247 38520	14520	12520	10520	8520	6520	4520	2520	520**	-1430	
	30	45139 42412	18412	16412	14412	12412	10412	8412	6412	4412	2412	3
11000	15	33153 30153	6153	4153	2153	153**	-1847	-3847	-5847	-7847	-9347	
	20	39970 36970	12970	10970	8970	6970	4970	2970	970**	-1030	-3030	
	25	45372 42372	18372	16372	14372	12372	10372	8372	6372	4372	2372	
	30	49653 46653	22653	20653	18653	16653	14653	12653	10653	8653	6653	2
12000	15	36167 32894	8894	6894	4894	2894	894**	-1106	-3106	-5106	-7106	
	20	43604 40331	16331	14331	12331	10331	8331	6331	4331	2331	331**	
	25	49497 46224	22224	20224	18224	16224	14224	12224	10224	8224	6224	
	30	54167 50894	26894	24894	22894	20894	18894	16894	14894	12894	10894	2

note that LL 6000 per year to LL 12000 per year income groups can get at least one house under the present program. Over a period of 25 or 30 years.

No. of beneficiaries by house size	3	3	1	4	1	3	1	2	1
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Annex D₁

Project cost alternatives

* S: subsidy in L.L. millions.
* type: stands for size and/or type in m².

Table 3 -
no initial downpayment

Income share	30 %										35 %									
	15 years		20 years		25 years		30 years		15 years		20 years		25 years		30 years					
	House set		House set		House set		House set		House set		House set		House set		House set					
L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²	L.L. 500/m ²	L.L. 600/m ²			
																		Type	S	Type
5000																		65 9144		
6000								65 8477										75 9473 65 10973		
7000								75 9473	65 10973									80 10102 65 9102 90 12301 75 12301		
8000					65 6753			65 6873	75 8212	65 9712	85 10469	70 4969	60 5295		65 6217			80 10102 65 9102 90 12301 75 12301		
9000					75 8677	60 7035		85 9551	70 9051	100 13765	80 11965	65 4707		75 7462	65 8962			90 10831 75 10831 100 12630 85 13630		
10000	65 6030				80 7816	65 6816	95 10890	80 11390			90 13961	75 6619	60 2030	95 9953	80 6698			95 12566 95 10017 95 14959		
11000	70 5883	60 6883			90 12098	75 9598		90 13729			100 15357	80 6030	70 8030		85 9698			100 13017		
12000	75 5736	65 7236			95 8880	80 9380		95 13068			90 7942	75 7942			95 8943					
house choice	3 (17649)	2 (14119)	5 (44224)	4 (32829)	4 (35526)	5 (56950)	4 (42384)	5 (62825)	5 (30592)	3 (18002)	4 (32339)	5 (42500)	4 (39366)	5 (55527)	4 (43548)	4 (51863)				
project cost	210.	225.	243.	252.	240.	288.	243.750	291.6	222.	246.	240.	284.	251.250	302.4	247.5	288.				
loan needed	210.	225	243	252.	240.	288.	243.750	291.6	222.	246.	240.	284.	251.250	302.4	247.5	288.				
subsidy	35.298	42.357	53.069	49.244	53.289	68.340	63.576	75.390	36.712	36.004	48.509	51.001	59.049	66.632	65.322	77.195				
5000																		60 1973		
6000																		70 2301 60 3301		
7000								60 1973										70 2301 60 3301		
8000								70 2969										65 2462 70 - 60 1831 80 2630 65 1630		
9000								70 2969										65 2462 70 - 60 1831 80 2630 65 1630		
10000					60 -			70 2051	60 3051	75 1465	65 2965	60 2207		65 2462				70 - 60 1831 80 2630 65 1630		
11000					65 -			75 -	65 2390	85 2461	70 1961	65 1619		70 -	60 2207			80 1560 65 - 90 2959 75 2950		
12000	60 -				75 2098	60 -		85 2229	70 1729	95 3457	80 3957	70 3530	60 2030	80 2453	65 -	90 2288	75 2288	100 3288 80 - 90 2617		
house choice	2	0	4 (3478)	2	5 (4280)	4 7170	6 (14278)	4 (11836)	4 (7356)	2 (3972)	5 (7358)	4 (5150)	5 (6450)	5 (6865)	5 (18151)	6 (14452)				
project cost	187.5		210.	225.	228.	243.	242.5	270.	202.5	225.	237.	247.5	243.	266.4	240.	272.				
loan needed	187.5		210.	225.	228.	243.	242.5	270.	202.5	225.	237.	247.5	243.	266.4	240.	272.				
subsidy			5.217		5.136	10.766	14.278	17.754	11.034	11.916	8.830	7.725	7.740	8.238	15.781	14.452				

Annex D₁

Project cost alternatives

* S: subsidy in Lk. millions.
 * type: stands for size and/or type in m².

- Table 2 -
 Progressive downpayment

income share		25 %																30 %																
maturity period		15 years				20 years				25 years				30 years				15 years				20 years				25 years				30 years				
selection		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set						
		LL 500/m ²		LL 600/m ²		LL 500/m ²		LL 600/m ²		LL 500/m ²		LL 600/m ²		LL 500/m ²		LL 600/m ²		LL 500/m ²		LL 600/m ²		LL 500/m ²		LL 600/m ²		LL 500/m ²		LL 600/m ²						
i	income	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S					
	5000																																	
	6000													60	6979																			
	7000									65	7080			70	7268	60	8143					65	5968			65	7283			60	7729			
%	8000					65	6168			75	7467	60	6192	85	9431	70	9006	60	4323			75	6127	65	7402	90	8961	75	8497	85	9159	70	8722	
	9000	60	4897			75	6798	60	5561	85	7604	70	7192	100	11220	80	9570	70	5051	60	5876	90	8159	75	8159			85	9125			100	13464	
	10000	65	3941			85	7179	70	6779	100	9491	85	10291			95	12233	80	5529	65	4729	100	7815	85	8615			100	11389					
	11000	75	4797	60	3635	95	7309	80	7697			95	10615			90	5757	75	5757				95	8772										
	12000	85	5404	70	5029			90	8315							100	5735	85	6485															
house choice		4 (19039)		2 (8664)		4 (27454)		4 (28352)		4 (31642)		4 (34290)		4 (34898)		4 (38952)		5 (26395)		4 (22847)		4 (28009)		4 (32948)		3 (23428)		4 (37972)		4 (34832)		4 (41880)		
project cost		213.75		234.		240.		270		243.75		279.		236.25		270.		240.		256.5		247.5		283.5		230.		292.5		326.25		283.5		
loan needed		167.531		178.2		194.061		211.5		203.061		225.538		202.5		228.6		190.5		201.038		206.156		232.875		200.624		243.675		208.406		250.085		
subsidy		28.559		25.992		41.181		42.328		47.463		51.435		52.347		58.428		31.674		34.271		42.014		49.422		46.856		56.958		52.248		62.820		
	5000																																	
	6000																																	
	7000																																	
%	8000									60	1092			65	-							65	1877			60	-	70	2597			70	2597	
	9000					60	-			70	1417	60	2242	75	-	65	2145	60	-			75	1971	60	-	75	2586	60	1311	80	1968	65	-	
	10000					70	1179	60	1979	80	1491	65	-	90	2633	75	2633	70	1529			85	1815	70	1415	85	2112	70	1700	95	3151	75	-	
	11000	65	-			80	1497	65	-	90	1315	75	1315	100	2046	85	2821	80	1882	65	-	95	1409	80	1797	90	1578			90	1578		90	3160
	12000	75	1654	60	-	90	1565	75	1565			85	1639			95	2710	90	1985	75	1985			90	1879								100	2456
house choice		2 (1654)		1		4 (4241)		3 (3544)		4 (5315)		4 (5196)		4 (4679)		4 (10309)		4 (5396)		2 (1985)		4 (7072)		4 (5091)		4 (6087)		4 (6378)		3 (7716)		4 (5616)		
project cost		210.		216.		225.		240.		225.		256.5		247.5		288.		225.		252.-		240.		270.		236.25		270.		245.		297.		
loan needed		159.936		162.		176.25		185.55		181.875		201.038		189.968		225.676		176.25		191.925		194.061		211.500		196.781		218.25		207.624		239.963		
subsidy		4.962				6.562		7.088		7.972		7.774		7.019		15.464		8.094		5.951		10.608		7.637		9.131		9.567		15.432		8.420		

Annex D₁

Project cost alternatives

* S: subsidy in LL. millions.
 * Type: stands for size and/or type in m².

- Table 1 -
 Levelled down payment

Income share		25 %														30 %																	
Maturity period		15 years				20 years				25 years				30 years				15 years				20 years				25 years				30 years			
Selection		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set	
		LL. 500/m ²		LL. 600/m ²		LL. 500/m ²		LL. 600/m ²		LL. 500/m ²		LL. 600/m ²		LL. 500/m ²		LL. 600/m ²		LL. 500/m ²		LL. 600/m ²		LL. 500/m ²		LL. 600/m ²		LL. 500/m ²		LL. 600/m ²		LL. 500/m ²		LL. 600/m ²	
Income		Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S		
5000																																	
6000								60	5695					70	7980																		
7000						60	5226			70	6644	60	7444	80	8644	65	7844																
8000						65	4544			80	7593	65	6793	90	9307	75	9307	65	4824														
9000		60	4148			75	5362	65	7062	90	8543	75	8543	100	9971	85	10771	70	4177	60	4977	90	7035	75	7035								
10000		65	3942			85	7180	70	6780	100	9492	85	10292			95	12234	80	5530	65	4730	100	7816	85	8616								
11000		75	5736	60	4536	90	6498	75	6498			90	9641					85	4883	75	6883			90	7798								
12000		80	5530	70	4730	100	7816	85	8616			100	11390					95	6236	80	6636			100	9380								
House choice		4(19356)		2(9266)		6(36026)		4(28936)		5(37967)		6(54103)		4(35902)		4(40156)		5(25650)		4(23226)		5(31266)		6(44354)		4(28814)		5(45560)		3(25930)		4(43084)	
Project cost		210.		234.		237.5		265.5		240.		285.		255.		288.		237.		252		240.		285.		232.5		288.		245.		306	
Loan needed		168.		187.2		190.		212.4		192.		228.		204.		230.4		189.6		201.6		192.		228		186.		230.4		196		244.8	
Subsidy		29.034		27.798		36.626		43.434		45.560		81.154		53.853		60.234		30.780		34.839		37.519		44.354		43.221		54.672		51.860		64.626	
%																																	
5000																																	
6000																																	
7000																																	
8000																																	
9000						65	-			70	-	60	1343	80	1971	65	-	60	-														
10000						70	-	60	1980	80	1492	65	-	90	2634	75	2634	70	-														
11000		65	-			75	-	65	1698	90	2441	75	2441	95	1297	80	1697	75	-	65	2083	90	-	75	-	90	2929						
12000		70	-			85	1816	70	1416	95	1390	80	1796			90	3161	80	-	70	1836	100	1380	85	2180								
House choice		2		-		4(1816)		3(5094)		5(6916)		4(5580)		5(7209)		5(9599)		4		2(3919)		6(5703)		4(5831)		5(4475)		5(8299)		4(7884)		5(8652)	
Project cost		202.5		-		221.25		234		240.		252.		237.		266.4		213.75		243.		237.5		265.5		228.		288.		240.		284.4	
Loan needed		162.		-		177.		187.2		192.		201.6		189.6		213.12		171.		194.4		190.		212.4		182.4		230.4		192.		227.52	
Subsidy		-		-		2.724		10.188		8.299		8.370		8.651		11.519		-		11.757		5.703		8.746		5.370		8.959		11.826		10.382	

Annex D 3

Table 2.

Income groups considered:
L.L. 7000/year → L.L. 12000/year

Project cost alternatives

Normal distribution with 15% allocation to each of the houses at the limits, and 70% for the middle size house

Levelled down payment.

Income share	25 %												30 %											
	15 years			20 years			25 years			30 years			15 years			20 years			25 years			30 years		
	House set		House set		House set		House set		House set		House set		House set		House set		House set		House set		House set			
	income	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	Type	S	
%	7000											(60 -)				(60 1472)			(65 -)			(75 1973)	(60 -)	
	8000											(60 2107)							(65 1912)			(85 1969)		
	9000											(80 1971)						(65 2235)	(85 1051)			(95 1965)	(80 2365)	
	10000																	(85 1816)			(95 1390)	(80 1790)		
	11000																							(95 1557)
	12000																							
House choice												5(3)	5(2)					6(3)	4(2)	5(3)	5(3)	4(3)	5(3)	
Project cost												237.75						250.5		250.5	288.	255.	282.6	
on needed												190.2						200.4		200.4	230.4	204.	228.24	
subsidy												9.446						10.194		5.665	10.74	11.814	11.334	
Flexible maturity periods																								
%	7000																							(60 -)
	8000																							(60 1472)
	9000																							(65 -)
	10000																							(75 1973)
	11000																							(80 255)
	12000																							
House choice												3						6(3)		3		3	3	
Project cost												237.75						250.5		252.75		257.25	285.4	
on needed												190.2						200.4		202.2		205.8	228.24	
subsidy												8.523						10.194		7.263		9.058	10.621	

