

Family Planning Needs and Costs: Nepal, 1985-2000

Contraceptive prevalence will need to increase four-fold to reach a total fertility rate of 2.5

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In the early 1980s the Government of Nepal set a demographic target of reducing the current fertility rate of about six children per woman of child-bearing age to 2.5 by the end of the century. To achieve this target, increasing attention has been given to implementing family planning programmes both in the public and private sectors. The key questions are: What level of family planning practice will be required to reach this national target? Through what compositions of contraceptive method use can the fertility target be achieved? What might this effort cost?

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This report contains the results of an analysis aimed at answering those three questions. The analysis uses a methodology for contraceptive target-setting developed by Bongaarts (1984) and microcomputer software prepared jointly with Stover (1986).

Nepal's population policy and goals

Family planning had been included as part of the general development policy of Nepal since the mid-1960s. However, it was only in the mid-1970s that the Government explicitly articulated its policy with respect to population. One of the foremost policies called for a reduction in the population growth rate by direct and indirect means.

In 1983, the Government reassessed the overall demographic situation and set a target of reducing the total fertility rate (TFR) from about 6 per woman in 1985 to 2.5 in the year 2000, stating that:

“The magnitude of the population problems makes it imperative that fertility targets be set with a view to achieving minimum possible growth in the future” (National Commission on Population, 1983, p. 3).

A national population strategy with the following major thrusts has been adopted to achieve the target (National Commission on Population, 1983, p. 4):

Accord high priority to fulfilment of current substantial unmet demand for family planning services;

Integrate population programmes in all projects relating to environment, forestry, agriculture and rural development;

- Emphasize programmes that help to increase the status of women, female education and employment;
- Effective mobilization of local panchayats (village councils), class organizations and NGOs (non-governmental organizations), in view of the enormously important role of local communities in all population and fertility reduction programmes; and
- Control the steadily increasing immigration into the country.

The Government of Nepal has thus made a strong commitment to controlling population growth. Many of the anticipated achievements in other sectors of the society will depend on the extent to which this target is attained.

Organizational support and service delivery

The Population Policy Coordination Board was established in 1975, under the National Planning Commission, as the Government's first effort towards giving organizational structure to the national population policy. It became the National Commission on Population (NCP) in 1978 under the chairmanship of the Prime Minister. In 1982 it was reorganized as an independent, politically strong support system for population and family planning activities. Policy making and co-ordination of policy implementation, which are central responsibilities of NCP, are pursued by various internal divisions and subdivisions. NCP remains under the chairmanship of the Prime Minister and maintains its own secretariat with representation from various governmental and non-governmental organizations.

Family planning services are provided primarily through four channels (Thapa, 1989). The two largest are semi-autonomous agencies of the Ministry of Health: namely, the Family Planning/Maternal and Child Health Project (FP/MCH) and the Integrated Community Health Services Development Project (ICHSDP).

The FP/MCH Project provides services through 200 or more clinics and about 1,600 panchayar-based health workers. ICHSDP provides services through 1,492 village health workers and 348 community health leaders, who are supported by auxiliary health workers located at 744 ICHSDP health posts. Another service organization is the private and voluntary Family Planning Association of Nepal, with central offices in Kathmandu and 18 branch offices.

In addition, the Contraceptive Retail Sales Project was organized in 1978; in 1983 it was renamed as the Nepal Contraceptive Retail Sales Company, with the function of distributing contraceptive pills and condoms through more than 9,000 outlets in 73 districts of the country. This range of service-providing agencies will play a major role in implementing and achieving the national fertility target in the short- and long-term.

Future family planning needs

As noted above, NCP has set a specific goal for fertility, i.e., to achieve a TFR of 2.5 by the year 2000. The scheduled change is for the TFR of 5.8 in 1985 to reduce to 4.0 by 1990 and to fall to 2.5 by 2000.

Another scenario of fertility decline put forth in a recent round of population assessments by the United Nations (1986) estimates that the TFR will be 4.61 in the year 2000, according to the medium variant. The course of TFR change is from 6.05 in 1985 to 5.63 in 1990, to 5.18 in 1995 and then

to 4.61 in 2000. For the purpose of our analysis, we have taken the base TFR to be 6.05.

Two aspects of contraceptive practice are additionally important to consider for projecting the contraceptive prevalence level needed to achieve the targeted fertility rate. The first is the level of use-effectiveness, determined by the contraceptive method mix, and the second is contraceptive continuation. Four assumptions have been developed on the basis of these factors and the fertility targets for estimating future family planning needs:

Projection	TFR		Method mix	Discontinuation
	1985	2000		
I-A	6.05	2.5 ^a	Constant	High
I-B	6.05	2.5 ^a	Changing	Moderate
II-A	6.05	4.61 ^b	Constant	High
II-B	6.05	4.61 ^b	Changing	Moderate

Notes: ^a National Commission on Population (1983), ^b United Nations (1986).

Table 1 gives the method mix derived from the 1986 Nepal Fertility and Family Planning (NFFP) Survey data which are assumed to have held for 1985. From this survey of over 5,000 currently married women between the ages of 15 and 50, contraceptive prevalence was estimated to be 15.1 per cent

Table 1: Two assumptions of contraceptive method distribution for Nepal, 1985-2000: constant and changing

Method	Assumption A		Assumption B	
	1985	2000	1985	2000
Total	100.0	100.0	100.0	100.0
Pill	5.9	5.9	5.9	20.0
IUD	0.7	0.7	0.7	25.0
Injection	3.3	3.3	3.3	3.0
Female sterilization	44.7	44.7	44.7	21.0
Male sterilization	40.8	40.8	40.8	19.0
Condom	3.9	3.9	3.9	8.0
Other	0.7	0.7	0.7	4.0

Note: For details on constant and changing contraceptive method mix, see the text.

(Ministry of Health, 1987). The distribution of users across methods reflects a strong orientation towards delivery of contraceptive sterilization services in the various programmes. Approximately 85 per cent of current users are sterilization acceptors, almost equally divided between male and female methods.

Assumption B in [table 1](#) gives a hypothesized change in method mix, wherein temporary family planning methods ascend and sterilization declines in prominence. Gains are projected for the pill, IUD and condom methods in particular. This mix is more or less typical of those observed in other developing countries with active family planning programmes; however, the mix is typical in that few other least developed countries (LDCs) approach the vasectomy prevalence seen either at the present or future hypothesized level. Because of the cumulative retention of the number of persons sterilized in cross-sectional survey rates of contraceptive use, it is difficult to imagine the share of male sterilization falling much below what is assumed here, unless they age out quickly.

Two schedules of annual discontinuation rates, by method, assumed as high and moderate in the projections are:

Method	High	Moderate
Pill	.57	.35
IUD	.60	.15
Female sterilization	.02	.01
Male sterilization	.02	.01
Injection	.05	.05
Condom	.93	.75
Other	.50	.60

With the exception of the rate for “other” methods, the *high* schedule is taken from a World Bank (1983) study report. The *moderate* schedule is a hypothetical one, based on the experience of other LDCs.

The results of the projections are summarized in [tables 2](#) and [3](#). The estimated size of the female population in the reproductive age group at each five-year interval is taken from projections based on the fertility scenarios. The 1985 proportion of women aged 15 to 49 years currently married (85 per cent) is based on the 1981 census and is assumed to remain constant throughout the projection period. [Table 2](#) illustrates the dramatic growth in the numbers of married women in the child-bearing age group, which is a consequence of past rapid population growth. The fertility assumptions over the next 15 years have little impact on these projected female populations since the majority of

Table 2: Projected number of women of reproductive age and contraceptive prevalence, Nepal, 1985-2000

Indicator	1985	1990	1995	2000
Total fertility rate				
Projection I-A, B	6.05	4.00	3.25	2.50
Projection II-A, B	6.05	5.63	5.18	4.61
Women 15-49 years (thousands)				
Projection I-A, B	3 659	4 150	4 719	5 338
Projection II-A, B	3 659	4 165	4 750	5 393
Women 15-49 years in marital union (thousands)				
Projection I-A, B	3 110	3 528	4 011	4 537
Projection II-A, B	3 110	3 540	4 038	4 584
Percentage of married women of reproductive age currently using contraception				
Projection I-A	15.1	42.0	51.9	61.8
Projection I-B	15.1	42.5	53.0	63.8
Projection II-A	15.1	20.6	26.5	34.0
Projection II-B	15.1	21.0	27.5	35.9
Number of contraceptive users (thousands)				
Projection I-A	469.6	1 483.1	2 081.9	2 802.2
Projection I-B	469.6	1 499.2	2 127.2	2 895.7
Projection II-A	469.6	730.0	1 071.3	1 559.8
Projection II-B	469.6	743.1	1 110.4	1 646.8

the women eligible for child-bearing have been born. Projection I calls for 5.338 million women aged 15 to 49 years compared with 5.393 million women in Projection II.

The future course of fertility, on the other hand, implies significant increases in contraceptive prevalence. Current use levels will need to rise four-fold, i.e. from 15 to 62 per cent, in order to achieve a TFR of 2.5, as specified by the National Population Commission, given no change in method mix and high contraceptive discontinuation. A changing method mix and moderate discontinuation – Projection I-B – requires the prevalence to rise to 64 per cent, which is still very similar to Projection I-A. These estimates imply that the force of fertility reduction will push the projected prevalence level upward to a much greater extent than modifications in method mix or improvements in continuation rates.

If the United Nations fertility scenario is achieved, which by comparison

Table 3: Projected family planning use by projection type, Nepal, 1985-2000

Year	I-A		I-B		II-A		II-B	
	Using (per cent)	Users (thousands)	Using (per cent)	Users (thousands)	Using (per cent)	Users (thousands)	Using (per cent)	Users (thousands)
1985	15.1	469.6	15.1	469.6	15.1	469.6	15.1	469.6
1986	20.5	652.9	20.5	654.3	16.2	516.9	16.3	578.7
1987	25.9	845.5	26.0	849.2	17.3	566.5	17.4	570.5
1988	31.3	1 047.9	31.5	1 054.7	18.4	618.5	18.6	625.1
1989	36.7	1 260.3	37.0	1 271.3	19.5	673.0	19.8	682.6
1990	42.0	1 483.1	42.5	499.2	20.6	730.0	21.0	743.1
1991	44.0	1 593.1	44.6	1 613.9	21.8	792.5	22.3	809.6
1992	46.0	1 708.0	46.7	734.2	23.0	857.8	23.6	879.5
1993	48.0	1 827.9	48.8	1 859.9	24.2	926.1	24.9	953.0
1994	49.9	1 952.6	50.9	991.2	25.4	997.3	26.2	1 029.9
1995	51.9	2 081.9	53.0	2 127.7	26.5	1 071.3	27.5	1 110.4
1996	53.9	2 216.0	55.2	2 269.7	28.0	1 161.5	29.2	1 208.3
1997	55.8	2 355.3	57.3	2 417.8	29.5	1 255.4	30.8	1 310.8
1998	57.8	2 499.7	59.5	2 571.6	31.0	1 353.2	32.5	1 418.1
1999	59.8	2 648.7	61.6	2 731.0	32.5	1 454.6	34.2	1 530.1
2000	61.8	2 802.2	63.8	2 895.7	34.0	1 559.8	35.9	1 646.8

appears to be a more realistic proposition, then the needed level of contraceptive use will be 34 per cent (36 per cent with changes in method mix and continuation levels), i.e. double the present figure. The growth in the number of contraceptive users, shown for every five years in [table 2](#) and each year in [table 3](#), represents the combined impact of required increases in prevalence rates and inevitable growth in the size of the child-bearing population of women.

To achieve the NPC fertility target of 2.5, the number of users will need to increase from roughly half a million to 2.8 or 2.9 million over the 15-year period. A TFR reduction from 6.05 to 4.61 calls for about 1.6 million users in the year 2000, or 1.3 million fewer than implied by Projection I. The six-fold increase in the number of contraceptive users needed to achieve the NPC target is as much the outcome of an ambitious fertility reduction goal as it is the increase in the number of reproductive aged women in a conjugal union, since reaching a TFR of 4.61 already implies a three-fold increase in contraceptive use.

Table 4. Percentage of women currently in marital union aged 15 to 39 using contraceptives, by method and project, Nepal, 1985-2000

Method	1985 ^a	2000 ^a	1985 ^b	2000 ^b
Projection I-A				
Pill	0.9	2.5	3.1	3.6
IUD	0.1	0.3	0.4	0.4
Injection	0.5	1.4	1.7	2.0
Female sterilization	6.7	18.8	23.2	21.6
Male sterilization	6.2	11.2	21.2	25.2
Condom	0.6	1.6	2.0	2.4
Other	0.1	0.3	0.4	0.4
Projection I-B				
Pill	0.9	4.5	8.1	12.8
IUD	0.1	4.4	10.7	19.1
Injection	0.5	1.6	2.4	3.2
Female sterilization	6.1	15.6	15.3	13.4
Male sterilization	6.2	14.3	13.9	12.1
Condom	0.6	1.5	1.8	1.9
Other	0.1	0.5	0.8	1.3
Projection II-A				
Pill	0.9	1.2	1.6	2.0
IUD	0.1	0.1	0.2	0.2
Injection	0.5	0.7	0.7	1.1
Female sterilization	6.7	9.2	11.9	15.2
Male sterilization	6.2	8.4	10.8	13.9
Condom	0.6	0.8	1.0	1.3
Other	0.1	0.1	0.2	0.2
Projection II-B				
Pill	0.9	2.2	4.2	1.2
IUD	0.1	1.8	4.6	9.0
Injection	0.5	0.7	0.9	1.1
Female sterilization	6.1	1.7	7.9	7.5
Male sterilization	6.2	7.0	1.2	6.8
Condom	0.6	1.1	1.8	2.9
Other	0.1	0.4	0.8	1.4

Notes: ^a Constant method mix; ^b Changing method mix.

Table 4 shows the percentage of women in marital union who will be using each method of contraception at five-year intervals between 1985 and 2000, following the method mix assumptions shown in table 1. If no change in method mix is assumed, a 53 per cent use of sterilization (28 per cent female, 25 per cent male) is needed to achieve a TFR of 2.5 compared with 29 per cent for a TFR of 4.6. Observe, however, that it is also possible to achieve the low TFR target with an alternative method mix, i.e. pill use in the year 2000 at 13 per cent, IUD use at 19 per cent and sterilization at 12 to 13 per cent.

The general picture that emerges is of a very sizeable increase in the demand for each contraceptive method. This phenomenon is caused by (a) the large cohorts of women who will be entering the reproductive age group because they were born during Nepal's period of high fertility and (b) either a major increase in the prevalence rate of contraceptive use (Projection I) or a modest increase (Projection II). These users will unquestionably place heavy burdens on existing delivery systems as well as the resource requirements necessary to expand them.

Projected costs

The projected number of users of each method can be translated into annual supply requirements over the period 1985 to 2000 as shown in [table 5](#).

As implied by Projection I-A, the number of pill cycles to be distributed would need to increase from 360,100 to 2,148,900 between 1985 and 2000, while the number of condom units would increase from 1.83 million to 10.93 million. Projection II-A calls for distribution of 1.196 million pill cycles by the year 2000, since the fertility target is lower. Gains in pill share from a changed method mix (Projection II-B) will require 4.282 million pill cycles to be distributed annually in the year 2000. If average costs for supplying each method are available, a cost projection can be obtained by multiplying them against these supply requirements and factoring in other servicing costs, e.g. medical examination fees.

To place a different financial perspective on understanding future family planning needs, the cost per user has been estimated based on reported expenditures for 1984/85 (Central Bureau of Statistics, 1987: table 14.1) and the calculated number of 1985 users shown in [table 1](#). The cost per user was about \$US5.85 in 1985.

As a rough approach to estimating future costs for Nepal, the reported family planning expenditures and use over time were examined in two countries, namely India and Thailand, which circa 1985 had method mixes similar to those under assumptions A and B shown in [table 1](#). Since the Indian programme is also heavily oriented towards sterilization delivery and since the cost per user was found to be relatively stable, as shown in [table 6](#), one projection scenario of constant costs is proposed.

Thailand's recorded rise in contraceptive prevalence over the 1970-1985 period, from 15 to 62 per cent, nearly parallels the projected rise for Nepal (Projection I). Thus, we pursue a second scenario speculating that the financial implications of required change to organized delivery of birth control in Nepal will resemble those for Thailand. Current annual cost per user in Thailand is

**Table 5: Annual contraceptive supply requirements, Nepal, 1985-2000
by projection type (thousands*)**

Method	1985 ^a	2000 ^a	1985 ^b	2000 ^b
Projection I-A				
Pill	360.1	1 137.5	1 596.8	2 148.9
IUD	3.3	7.6	9.9	12.5
Injection	62.0	195.8	274.8	370.0
Female sterilization	79.5	93.4	83.3	98.8
Male sterilization	74.4	89.7	82.3	98.0
Condom	1 830.0	5 784.1	8 119.3	10,930.0
Projection I-B				
Pill	360.1	2 066.0	4 231.9	7 528.3
IUD	3.3	73.3	141.7	226.9
Injection	62.0	231.9	377.3	579.2
Female sterilization	79.5	55.7	22.8	9.6
Male sterilization	74.4	54.2	24.4	12.2
Condom	1 830.0	5 397.3	7 021.2	8 690.0
Projection II-A				
Pill	360.1	559.9	821.7	1 196.0
IUD	3.3	3.6	5.2	7.0
Injection	62.0	96.4	141.4	206.0
Female sterilization	27.7	35.2	49.2	63.3
Male sterilization	26.8	34.3	48.1	62.1
Condom	1 830.0	2 847.0	4 178.2	5 670.0
Projection II-B				
Pill	360.1	1 024.0	2 208.7	4 282.2
IUD	3.3	28.6	64.4	111.3
Injection	62.0	95.1	137.7	197.6
Female sterilization	19.4	18.8	16.5	10.7
Male sterilization	19.2	18.8	16.9	11.6
Condom	1 830.0	3 913.6	7 366.0	13,170.0

Notes: * Pill requirements are given in terms of thousands of cycles; IUD and injections in terms of thousands of insertions/injections; sterilization (male and female) in terms of thousands of procedures; condoms in terms of thousands of units.

^a Constant method mix; ^b Changing method mix.

\$US23.40, and this amount is used as an estimate for Nepal in the year 2000, linearly interpolating the cost for 1990 and 1995 at \$US11.70 and \$US17.50, respectively.

The results of these calculations are given in table 7. The total annual

Table 6: Estimated family planning expenditures and users in India and Thailand, 1970-1985

Year	India			Thailand		
	Expenditures (thousands of (\$US))	Users (thousands)	cost per user (\$US)	Expenditures (thousands of (\$US))	Users (thousands)	cost per user (\$US)
1970	75,756	10,475	7.23	900	803	1.12
1975	111,750	25,371	4.40	9 350	1 677	5.60
1980	183,000	24,901	7.35	26,000	2 171	12.00
1985	269,600	41,556	6.49	116,000	4 948	23.40

Sources: Expenditure data = Ross *et al.* (1988); users data = estimated from contraceptive prevalence rate and population of married women in the reproductive age groups.

cost of contraception will rise precipitously in the next 15 years from a current amount of \$US2.74 million to \$US16.39 million, or five-fold, to achieve the NPC fertility target. This is in spite of annual costs per user remaining constant at \$US5.85. If the lower fertility level is attained, an expenditure of \$US9.12 million, a two-fold increase, would still be required. To follow the Thai model of service expansion implies that family planning expenditures would need to rise 24-fold to \$US67.76 million in 2000 to reach the NPC target, or to \$US38.54 million, a 13-fold increase, to reach the United Nations estimate.

Table 7: Summary of projected contraceptive cost, Nepal, 1985-2000 (thousands of \$US)

Projection	1985	1990	1995	2000	1985-2000 percentage increase
Constant user cost^a					
Projection I-A	2 735.5	8 676.1	12,179.1	16,392.9	499
Projection II-A	2 735.5	4 270.5	6 267.1	9 124.8	234
Increased user cost^b					
Projection I-B	2 735.5	17,540.6	37,234.8	67,759.4	2 377
Projection II-B	2 735.5	8 694.3	19,432.0	38,535.1	1 309

Notes: ^a Cost constant at \$US5.85 per user;
^b Cost increases linearly over interval to \$US11.70 in 1990, \$US17.50 in 1995, and to \$US23.40 in 2000.

The earlier message of necessary service expansion is clearly confirmed with these cost projections. The challenge to the Government of Nepal will be to develop effective financing strategies to accommodate the projected needs in contraception. Will these costs be the total or predominant responsibility of the public sector, or will cost recovery measures through lesser subsidization of retail costs of contraception be needed? An important issue will be the "tailoring" of the subsidies to acceptable levels without compromising the adoption of contraceptive practices and without incurring undue costs to underprivileged users.

In assessing family planning needs and costs, an important policy and programmatic issue that needs to be considered is the effect of changing contraceptive technologies (Gillespie *et al.*, 1989). The costs for already available but improved products or newly developed contraceptives could affect the scenario considerably. IUDs and subdermal implants are cases in point.

The newer generation of IUDs (TCu-T, TCu-7, MLCu-250, or MLCu-375) are considerably more expensive than the older inert IUDs (Lippes loop). But beyond cost, the newer type of IUDs have been shown to be more effective in preventing pregnancies and also have lower expulsion rates than the conventional types (Sivin and Stern, 1979; Sung *et al.*, 1985). At issue is whether the new types of IUDs should be preferred to the conventional types, even though they are more expensive. Alternatively, should cost be the more important determining factor for a resource-poor country such as Nepal? While there are no fixed answers to these questions, some programmatic and logistical issues should be taken into account in making the decisions. The newer IUDs need to be removed every five years; in contrast, the conventional types may be safely left *in situ* until menopause. This aspect may be an important consideration from the accessibility point of view. In this respect, the newer types may not necessarily be the most appropriate products. On the other hand, if the expulsion rate is known to be a major problem or if the pregnancy rates are high, it may be more prudent to consider introducing the new products.

The subdermal implant is an example of a newly developed contraceptive. The implant is relatively expensive contraceptive; it may cost \$US25-35 per user to provide a set of implants. Because of this, some programmes may find it too costly to provide them on a large scale. Yet in terms of ease and convenience of use, high efficacy and high acceptability, the implants may be an attractive contraceptive to an otherwise underserved group of people (Thapa *et al.*, 1990). Hence, the cost consideration may be partly off-set by the need to provide contraceptives to eligible couples. The calculus in costing the role of new technologies is made complex by the possibility that their introduction may raise overall contraceptive demand as well as affect supply. Gillespie *et al.* (1989) suggest that, of the total financing costs, commodity costs tend to be less than those of service delivery.

These issues underscore an important point: trade-offs in contraceptive technology and service delivery capabilities are imminent and thus need to be considered in the planning and decision-making processes. The accumulated experience of providers and the availability of resources are key inputs to this process, as are results from well-designed and executed studies.

Conclusion and implications

Nepal's target of achieving a TFR of 2.5 by the year 2000 is an ambitious one; the target is 54 per cent lower than what is considered by the United Nations to be a plausible course for fertility reduction. Regardless of its plausibility though, the results presented in this article suggest the enormity of the challenge that Nepal faces.

Even to achieve the United Nations target of a TFR of 4.6, the level of current contraceptive use will need to increase two-fold, and accordingly, the number of users will need to increase three-fold (from about 470,000 to 1.6 million). If the TFR is to be reduced to 2.5, the corresponding figures involve five-fold and six-fold increases, respectively.

Other findings that have important programmatic and policy implications are that:

- Increased effort may be given to the promotion and use of modern reversible contraceptive methods and lesser emphasis placed on sterilization without necessarily affecting the overall demographic impact, i.e. the fertility level. Another strong rationale for putting more emphasis on providing services for non-permanent birth control methods is that there may be significant unmet demand for contraception to achieve birth-spacing.
- The current continuation rates for reversible methods remain at low levels. Special effort should be taken to improve continuation rates, since they bear directly upon programmatic requirements of acceptor levels to achieve targeted use levels.
- Even if the cost per user remains constant into the future, the projected total cost for achieving the lower fertility target is \$US16.4 million annually, nearly a 500 per cent increase over family planning costs in 1985.
- Assuming that the cost per user for future delivery of family planning services rises with the necessary expansion of the infrastructure, the present estimates call for as much as a 24-fold increase, or \$US68 million in the year 2000 to achieve a TFR of 2.5.

Many of the anticipated achievements in other sectors of society will depend to a large extent on future family planning programme performance directed at meeting the demographic target. The results presented in this article suggest that the fertility target may need to be re-evaluated, that existing programme strategies of service delivery need to be reviewed for their method orientations, others developed and expanded, and that sufficient resources will need to be marshalled if the national goal of fertility reduction is to be achieved.

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