



श्री ५ को सरकार

P. Box No, 1950

HIS MAJESTY'S GOVERNMENT OF NEPAL

कृषि मन्त्रालय

MINISTRY OF AGRICULTURE

राष्ट्रिय कृषि अनुसन्धान केन्द्र

National Agricultural Research Centre

राष्ट्रिय गाई भैंसी अनुसन्धान कार्यक्रम

पत्र संख्या:-

Ref. No. 137/048/49

धुमलटार, ललितपुर नेपाल ।

Goat Production System

NARC

Khumaltar, Lalitpur
Kathmandu, Nepal

National Bovine Research Program

Khumaltar, Lalitpur Nepal

Ph. No. 5-21423

मिति

Date November 20, 1991

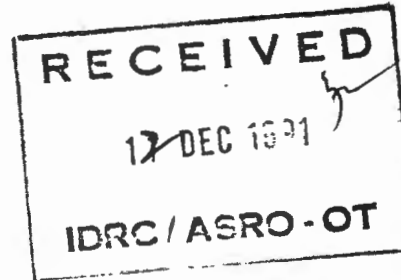
विषय:-

Subject:- Technical Report

Dr C. Devendra

Senior Program Officer

IDRC , Singapore



Dear Dr. Devendra

Here, I have enclosed the technical report No. 2 . It covers upto September , 1991 . I think it will support to release the budget for this fiscal year 15 July 1991 to 14 July 1992 .

The completion date of the project is March 20, 1992 . But, our project work may not be completed within this period . Perhaps, we may need one year more to complete the original objectives of the project . So, will you please forward this matter for the required procedure .

with best wishes

H.R. Shrestha
(H.R. Shrestha)

C:C - Dr. G.C. Hawtin

Director ,

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✓ W.A. Reyes

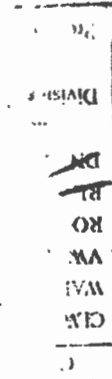
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Bandhipur, Tanahu

- N A R C , Khumaltar.



GOAT PRODUCTION SYSTEM (NEPAL)

**Project No. 3-P-87-0048
(HMG, Nepal/IDRC)**

MID-TERM TECHNICAL REPORT

- 1. Goat production system in Nepal.**
- 2. Evaluate appropriate interventions to increase productivity in goats.**

**Submitted by,
Hari R. Shrestha
Project Co-ordinator, GPS Nepal
Nepal Agricultural Research Council
Khumaltar, Lalitpur
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GOAT PRODUCTION SYSTEM (NEPAL)

Project No. 3-P-87-0048

Technical Report

Study No. 1.

Objectives:

The main objectives are to study:

1. The physical and production characteristics of local goat breeds raised at four ecological belt of Nepal.
2. The prevailing management systems.
3. The socio-economic.

Methodology:

Four local goat breeds raised at four ecological zones of Nepal were being studied. Baseline survey of goat raising potential areas were done. Based on the survey report, potential pockets were identified & recorded the goat population of about 500 adult doe (over 3 years of age). Interested farmers to be involved in the programme were registered. Adult does were ear tagged for identification. 100-150 animals were included from each location. Physical characters, breeding characters, body weight changes of adult animals & their production performances were studied.

Locations with respective breed:

<u>S.No.</u>	<u>Locations</u>	<u>District</u>	<u>Altitude</u>	<u>Breed</u>	<u>Stage of study</u>
1.	Marpha	Mustang	2743-4000 m.asl.	Chyangra	Cont...
2.	Lete	,,	3000 m.asl	Sinhal	Cont...
3.	Ghasekuwa	Tanahu	300- 800 m.asl.	Hill Goat	Complete
4.	Sunaul	Nawalparasi	111- 500 m.asl.	Terai Goat	Complete

Results observed:

Main physical characters of four recognized goat breed are presented below.

Characters	Breed			
	Chyangra	Sinhal	Hill goat	Terai goat
No. of observation	100	100	124	136
Body height (cms) Range	62.47 \pm 0.28 (57-71)	67.04 \pm 0.36 (60-73)	55.90 \pm 0.28 (51-64)	57.94 \pm 0.32 (48-69)
Body length (cms)	62.35 \pm 0.36 (51-73)	68.73 \pm 0.44 (60-78)	63.18 \pm 0.39 (55-71)	58.12 \pm 0.43 (46-70)
Heart girth (cms)	71.37 \pm 0.37 (63-78)	77.76 \pm 0.45 (67-89)	65.50 \pm 0.37 (57-75)	65.23 \pm 0.44 (53-77)
Loin girth (cms)	70.26 \pm 0.43 (62-83)	80.81 \pm 0.61 (62-95)	72.80 \pm 0.53 (59-90)	74.05 \pm 0.62 (59-93)
Head length (cms)	18.04 \pm 0.12 (12-21)	20.19 \pm 0.09 (18-23)	16.32 \pm 0.10 (14-20)	17.71 \pm 0.10 (15-23)
Head width (cms)	12.20 \pm 0.09 (10-22)	12.82 \pm 0.12 (7-15)	10.84 \pm 0.07 (9-13)	11.69 \pm 0.05 (10-13)
Horn length (cms)	22.42 \pm 0.29 (17-28)	18.71 \pm 0.29 (13-24)	10.67 \pm 0.21 (6-16)	8.06 \pm 0.22 (3-14)
Neck length (cms)	28.94 \pm 0.18 (26-30)	31.02 \pm 0.34 (25-36)	32.35 \pm 0.24 (25-40)	30.69 \pm 0.22 (25-37)
Neck size (cms)	33.24 \pm 0.23 (28-38)	38.27 \pm 0.45 (29-50)	26.09 \pm 0.20 (21-31)	25.60 \pm 0.20 (19-31)
Ear length (cms)	13.43 \pm 0.09 (12-15)	14.82 \pm 0.19 (8-18)	14.72 \pm 0.03 (12-17)	16.10 \pm 0.15 (9-25)
Ear width (cms)	5.74 \pm 0.05 (5-7.5)	6.62 \pm 0.07 (4-8)	6.87 \pm 0.03 (6-8)	6.87 \pm 0.06 (5-9)
Belly height (cms)	32.75 \pm 0.20 (29-39)	35.33 \pm 0.23 (30-43)	27.73 \pm 0.21 (21-39)	28.74 \pm 0.24 (22-36)
Tail length (cms)	9.88 \pm 0.09 (8-18)	11.61 \pm 0.16 (7-18)	11.29 \pm 0.11 (9-15)	11.59 \pm 0.10 (8.5-15)
Colour	Black with white strips on leg and head, light brown.	White dominated	Brown, Raddish Dark black	Brown, Black, Reddish

Note: Values are means \pm S.E. with range in parenthesis.

Other technical reports are presented seperately, (location wise)

Project area - Ghansekuwa, Tanahu.
 Altitude - 800 to 1300 m.a.s.l
 District Area - 1546 sq.km
 Goat breed - Hill Goat
 Goat population - 111000

Average body-weight of adult doe at different months
 (Mean \pm S.E.): with number of observations in parenthesis.

Month	Body weight (kgs)	Month	Body weight (kgs)
March 1989	22.35 \pm 0.41 (124)	September 1989	24.50 \pm 0.66 (114)
April	23.04 \pm 0.49 (123)	October	25.66 \pm 0.63 (115)
May	23.29 \pm 0.48 (122)	November	25.51 \pm 0.45 (112)
June	22.76 \pm 0.50 (122)	December	25.47 \pm 0.47 (108)
July	22.92 \pm 0.50 (119)	January 1990	25.29 \pm 0.44 (105)
August	23.48 \pm 0.55 (118)	February	24.91 \pm 0.38 (104)
		Average	24.09 \pm 0.34

Average body-weight of kids:

The kids, which were born from identified does of project area, were recorded untill the end of the study period. The average birth weight and monthly body-weight of the kids, up to the age of one year, are presented below.

Age of kids (month)	Body-weight (kgs)	
	Male	Female
At birth	1.53 \pm 0.05 (93)	1.48 \pm 0.05 (88)
1	3.25 \pm 0.13 (93)	2.82 \pm 0.11 (88)
2	5.53 \pm 0.18 (90)	4.66 \pm 0.44 (86)
3	7.25 \pm 0.22 (61)	6.37 \pm 0.19 (73)
4	9.01 \pm 0.30 (61)	7.92 \pm 0.25 (70)
5	10.19 \pm 0.32 (60)	8.86 \pm 0.26 (64)
6	11.34 \pm 0.37 (59)	9.49 \pm 0.31 (62)
7	12.61 \pm 0.43 (46)	10.29 \pm 0.37 (49)
8	13.79 \pm 0.61 (33)	10.77 \pm 0.41 (45)
9	14.11 \pm 0.66 (26)	11.49 \pm 0.43 (38)
10	14.51 \pm 0.89 (26)	11.72 \pm 0.50 (37)
11	15.16 \pm 0.90 (17)	12.05 \pm 0.55 (27)
12	15.15 \pm 1.29 (17)	12.44 \pm 0.79 (26)

Note: Values are means \pm S.E. with number of observations in parenthesis.

Kidding interval:

Total 124 numbers of does were taken under study. Only 109 does kidded during the study period of one year. Kidding intervals were found varrying from 6 months to 12 months. Average mean kidding intervals were estimated as such 230 ± 38 days (S.D.)(27).

Litter size:

109 adult does produced 180 kids. Total number of kiddings by these does were 134. So, the kid born per doe per annum (litter size) is 1.65. kidding percentage is 145.16 (number of kids born to number of doe exposed to buck).

Twining:

Out of 134 kidding, 39 produced twins showing twining percentage 29.10.

Mortality in adult doe:

Among 124 breeding doe, 10 died due to various disease, mainly because of internal parasites & diarrhoea.

Selling:

10 does were removed from the study and sold, for breeding.

Kids:

During the study period 180 kids were born, 14.4% died due to various diseases 13.8% removed up to the age of one year for various purposes (breeding and sacrificing in festivals). It is shown below in table.

Mortality and selling of kids at different age (number)

Age (months)	1	2	3	4	5	6	7	8	9	10	11	12
Mortality due to disease	-	4	7	4	-	5	3	-	1	-	2	-
Sold	-	2	-	5	3	-	6	3	4	1	1	-
Total	-	6	7	9	3	5	9	3	5	1	3	-

Project Area : Sunaul, Nawalparasi.
Altitude : 111-500 m.a.s.l.
District Area : 2162 sq.km
Goat Population: 80000

To represent Terai region, same study was replicated in Sunawal, Bishasaya of Nawalparasi district. The data recorded during the period of one year are presented here.

Monthly average body-weight change of adult does.

Month	Body-weight (kg.)
November, 1989	23.44 \pm 0.44 (136)
December	23.89 \pm 0.45 (136)
January, 1990	24.24 \pm 0.46 (135)
February	23.81 \pm 0.43 (134)
March	23.83 \pm 0.41 (132)
April	23.37 \pm 0.39 (128)
May	23.12 \pm 0.37 (124)
June	23.19 \pm 0.37 (121)
July	22.60 \pm 0.44 (117)
August	22.80 \pm 0.42 (110)
September	23.20 \pm 0.4 (102)
October	22.40 \pm 0.39 (97)
Average	23.32 \pm 0.15

Note:

Values are means \pm SE with the number of observations in parenthesis.

During the rainy season June, July, August animals have lost their body-weight, little bit, due to parasite infestation. Pasture and fodder trees are equally available enough all around the year. So, body-weight changes do not seem significant.

Monthly average body-weight of kids.

Age of kids months	Male (kg.)	Female (kg.)
Birth weight	1.58 \pm 0.09 (88)	1.44 \pm 0.08 (88)
1	3.50 \pm 0.11 (84)	3.26 \pm 0.11 (80)
2	5.40 \pm 0.14 (80)	5.00 \pm 0.14 (69)
3	7.10 \pm 0.15 (76)	6.30 \pm 0.14 (68)
4	7.80 \pm 0.32 (74)	7.18 \pm 0.15 (62)
5	8.90 \pm 0.18 (74)	8.00 \pm 0.18 (53)
6	10.00 \pm 0.22 (52)	9.10 \pm 0.22 (51)
7	11.70 \pm 0.33 (38)	9.70 \pm 0.24 (42)
8	12.60 \pm 0.39 (27)	10.40 \pm 0.24 (37)
9	12.50 \pm 0.39 (23)	10.30 \pm 0.27 (34)
10	10.50 \pm 0.16 (13)	10.60 \pm 0.28 (29)
11	14.00 \pm 0.49 (12)	11.66 \pm 0.35 (28)
12	14.20 \pm 0.56 (7)	11.9 \pm 0.39 (21)

Note: Values are means \pm S.E. with the number of observations in parentheses.

Litter size:

136 adult doe were taken under study. Among them only 115 doe kidded 145 times within a year producing 222 kids. So the estimated litter size (number of kids born per doe per annum) is 1.93. Kidding percentage is 163.23 (number of kids born to the number of doe exposed). Number of kidding per doe per year is 1.06. Kidding performance shown below:

		Birth type. (%)
Total kids born	= 222	Single - 50.36
Single born	= 73	Twin - 46.20
Twin	= 134	Triplet- 3.44
Triplet	= 15	

Average birth weight (kg.) according to birth type:

<u>Single</u>		<u>Twin</u>		<u>Triplet</u>	
M	F	M	F	M	F
1.73 ± .09 (45)	1.57 ± .12 (28)	1.54 ± .07 (81)	1.53 ± .08 (53)	1.39 ± .23 (10)	1.04 ± .48 (5)

Note:- Values are mean ± S.E. with the number of observations in parenthesis.

Kidding interval:

Among 115 kidding does, 31.3% kidded two times during the study period of 360 days. Kidding interval is estimated to be 225 ± 51 days ranging from 180 to 360 days.

Kids:

Total 222 kids were born among these kids 27.47 percentage died due to various diseases. These young kids are sold for sacrificing in the festivals. Some are sold for breeding purpose too. However selling percentage is 30.18. Again 4.9 percentage is killed by predators while taking in forest for grazing.

Mortality, sold and killed by predators at different ages during the study period (number).

Months (age)	1	2	3	4	5	6	7	8	10	11	12	Total
Mortality due to diseases.	4	3	7	7	4	10	7	4	1	2	2	61
Sold	-	1	1	6	8	7	17	7	7	3	4	67
Predators	-	-	1	-	4	2	-	-	1	1	1	11

Adult does: mortality, sold & killed:

- a) 8 Adult doe died (5.3%) due to various diseases mainly diarrhoe, internal parasites and Tympany.
- b) During the study period 14 (10.3%) adult does were removed from the flock with various purposes such as selling for breeding.

Marpha and Lete two locations are situated in Mustang districts. It is the most remote and difficult area. Physical characters of adult doe were recorded in detail. Body weight changes of identified does were recorded only at three different season in the study period of one year. Likewise kidding from identified does were recorded in one season when maximum number of kidding takes place.

Project area	- Marpha
Altitude	- 2743 to 4000 m.a.s.l.
District area	- 3573 sq.km.
Breed	- Chyangra
Goat population	- 53000

Average body weight of adult doe:

Month	Body weight(kg.)	Mean \pm S.E. with No. of observations in parenthesis.
June	27.0 \pm 0.31	(98)
September	32.5 \pm 0.39	(98)
April	27.9 \pm 0.36	(82)
Average	29.13 \pm 0.69	

Body weight changes are found mainly due to seasonal variation. Highest body weight 32.5 \pm 0.39 is found just after the rainy season while approaching to cold & dry winter season. Untill the dry seasons, while new pastures are not come, they just maintain their body weight by depleting body reserves. So, only during the rainy season, they gain body weight & replenish body reserves.

Adult doe - Mortality, sold and killed by predators

Disease	-	6
Killed by predators	-	8
sold	-	3
Hanged in tree branches	-	1

Average birth weight (kg.) of kids (Mean \pm S.E.):

Male	Female
1.95 \pm .14 (21)	1.92 \pm .14 (20)

Project area	-	Lete, Mustang.
Altitude	-	3000 m. a.s.l.
Goat breed	-	Sinhal
Goat population	-	12000

Average body weight of adult doe:

Month	Body weight (kg.)	Mean \pm S.E.
June	34.6 \pm 0.5	(108)
September	35.5 \pm 0.57	(97)
April	34.5 \pm 0.53	(66)
Average	34.8 \pm 0.12	

On and average there was slightly difference in body weight changes of adult doe due to seasonal variation.

Average birth weight (kg.) of kids (Mean \pm S.E.):

Male	Female
3.0 \pm 0.15 (16)	2.7 \pm .12 (16)

Adult doe - mortality, sold, killed by predators during the study period.

Mortality due to disease	-	4
Sold	-	15
Killed by predators	-	12
Hanged in branches	-	1

Study No'-2

Objectives : To evaluate appropriate interventions to increase productivity.

Program started Date: July, 1990.

Materials and Methods

A total no. of 56 does and four bucks of the hill goat breed were purchased from the near by villages. Later on 15 does and 1 buck were placed in each of following three treatments. This study is conducted at Goat Research Centre, Bandipur.

1. Group A - Control grazing
(Traditional management system)
2. Grazing plus supplementation with maize + cow pea in summer and Oats + Vetch in the winter.
3. As in No. 2 plus 200 gms of concentrates per head per day.

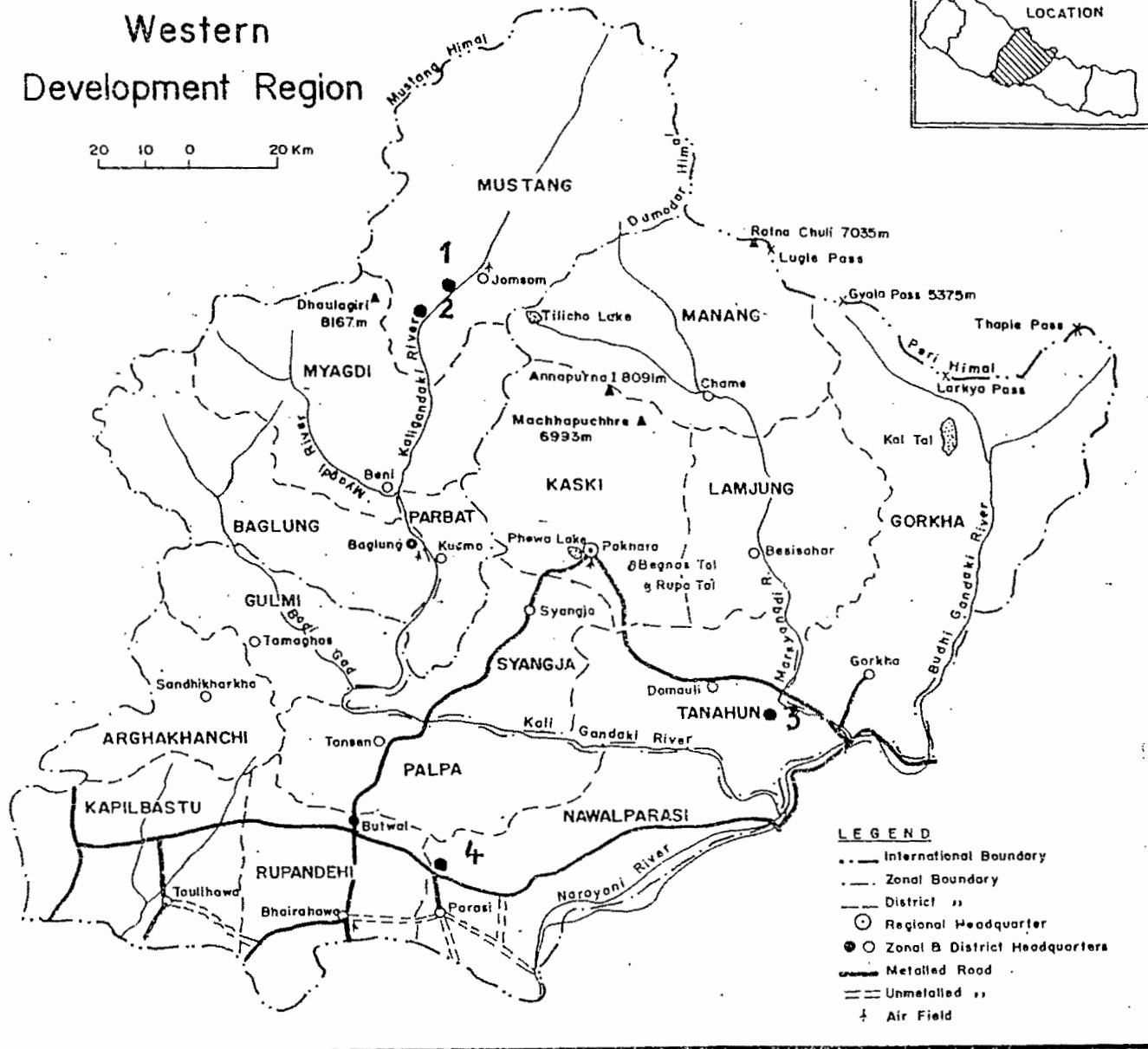
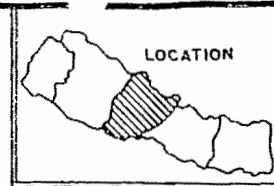
Results of the above study have been obtained upto September 1991. It is presented below. Rest study programme is going on.

Reproductive Performance of doe kept at three treatment group A,B,& C

S.NO.	Traits	Group A	Group B	Group C
1	No. of kiddings	15	19	19
2	No. of kids born	Male - 8 Female - 8	Male - 9 Female - 14	Male - 11 Female - 13
3	Birth type	Twin - 1 Single - 14	Twin - 4 Single - 15	Twin - 5 Single - 14
4	Average Birth weight. (Kg.)	M - 1.5 \pm .47 F - 1.3 \pm .4	M - 1.4 \pm .26 F - 1.3 \pm .32	M - 1.6 \pm .38 F - 1.44 \pm .49
5	Average body wt. kg. at 3 month's age	6.42 \pm 1.9 (10)	5.27 \pm 1.76 (8)	6.7 \pm 2.26 (14)
6	Weight gain per day upto 3 month's age	74 gms.	58 gms.	74 gms.
7	Mortality (No) upto 3 month's age	5	12	9

Western Development Region

20 10 0 20 Km



SURESH MAHARJAN

Project location

- 1.. Marpha (Mustang)
- 2.. Lete , ,
3. Bandipur, Ghasekuwa (Tanahu)
4. Bishasaya, Sunwal (Nawal Parā)

Western development Region: It lies in the central part of Nepal between the Central Development Region and the Mid-Western Development Region. It ranks third in the point of economic development. It covers 20 per cent of the total area (second position) and shares 21 per cent of the total population (third position) of the Kingdom. It contains three zones and sixteen administrative districts. Pokhara is the development centre of the region. It is highly notable for tourist traffic. Tarai and Pokhara Valley are the most developed parts of the region.



Project districts:

- Mustang(High hill)
- Tanahu(Mid hill)
- Nawalparasi (Terai)

Suresh Maharjan

Administrative Divisions: Nepal has three levels of administrative division: 5 development regions, 14 zones and 75 districts. Each zone is composed of several districts (4 to 8 in number). Among districts, Dolpa is the largest and Bhaktapur the smallest in terms of total area covered by them. In physical location, 16 districts lie in the mountain (Himalaya) region, 39 districts in the hilly region, and 20 districts in the Terai region.