

## Larger forests into fewer hands: how equitable is Community forestry in Nepal?

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This paper assesses the much talked equity aspect in community forestry. There is an increasing concern regarding the hand over of community forests without any threshold for per household forest area. Using Gini coefficient as a measure of inequality, this paper concludes that there is high inequality in the hand over of community forests to the beneficiary households.

**Keywords:** Gini coefficient, inequality, community forests, household

Much has been written about the equity aspect of Community Forestry (CF). A compendium of research papers published by Winrock International-Nepal in 2002 includes many papers on this aspect. The main concern expressed in these papers is that community forests are being handed over in a haphazard way without any consideration on equity aspect. Larger tracts of forests (>100 ha) have been handed over to the Forest User Groups (FUGs) comprising fewer households while a large number of households are included in smaller patches of community forests (<100 ha). This has led into a situation where material benefits are not accruing sufficiently to a large number of forest user households while a few households are using forests indiscriminately.

It necessitates a serious empirical test on equity in community forestry. This paper aims to quantify the magnitude of inequality arising due to this discriminatory practice of hand over of community forests.

### Materials and method

A tool called *Gini concentration ratio* or simply *Gini coefficient* is used to assess inequality. The tool is named after the Italian Statistician who first formulated it in 1912. The tool is an aggregate numerical measure of inequality ranging from 0 (perfect equality) to 1 (perfect inequality). The higher the value of the coefficient, the higher the inequality of distribution; or other way round. This tool is used to find out whether the distribution of community forests to the beneficiary households has remained equitable or as

feared by many Scholars (Bhatta, 2002a,b; Tiwari, 2002 etc) that larger tracts of forests are handed over to small group of households while a large number of households are accommodated in smaller patches of forest from which the latter can get almost no material benefit.

For grouped data Gini coefficient is calculated by using the following formula (Kanel, 1993).

$$G = \sum X_i Y_{i+1} - \sum X_{i+1} Y_i$$

Where  $X_i$  denotes the cumulative proportion of the population in the  $i$ th class interval, and  $Y_i$  denotes the cumulative proportion of the population in the  $i$ th class interval.

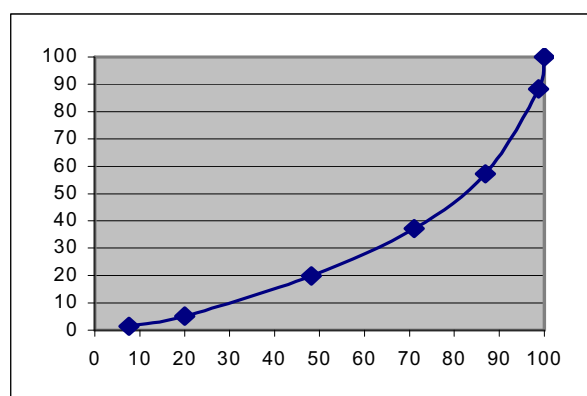
When the variables are measured as percentages, both of them have to be divided by 100. In this case the above equation has to be written as:

$$G = 1 / (100)^2 [\sum X_i Y_{i+1} - \sum X_{i+1} Y_i]$$

### Results and discussion

Figure 1 shows the distribution of community forests by cumulative percentages of households and forest area. It is the construction of a Lorenz curve for the distribution of community forests in Nepal and is based on the national FUG database. The further the curve from the diagonal line passing through the origin, the greater is the inequality in the distribution of community forests. The figure clearly shows that almost 70% of the households are accommodated within little more than 30% of the total community forest area while nearly 70% of the forest area is handed over to just about 30% of the forest user households.

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**Figure 1: Distribution of community forests by cumulative percentage of households and forest area.**

The distribution of community forests in Nepal by size of the forest is given in Table 1. Scrutinizing the table shows that 63% of the households have community forests less than 100 hectares and it constitutes only 29% of the total area of the community forest. The remaining 37% of the households have community forests larger than 100 hectares and such forests constitute 71% of the total area of the community forest. This suggests high inequality in the handing over of community forests to the local FUGs and consequently the *Gini coefficient*

is 0.445. The detail of the calculation of *Gini coefficient* is given in the Annex 1. The larger-sized community forests are in the hand of fewer households in comparison to smaller-sized community forests in which a larger number of households are accommodated in the FUGs.

The basic statistics of community forestry in Nepal by size of the forest is given in Table 2. From Table 2, we can see that per household community forest area ranges from 0.08 to 3.96 ha depending on the smallest and largest forest tracts. The table again justifies the claim that community forests are handed over on demand basis rather than any consideration of supply side.

## Conclusion

The calculated *Gini coefficient* shows high inequality in the distribution of community forests. The distribution has remained largely inequitable. The larger tracts of the community forests have been handed over to the FUGs comprising fewer households while a large number of households have been included in the smaller community forests. Hence, it is strongly recommended that the concerned

**Table 1: Gini coefficient of community forest distribution by size of the forest in Nepal, 2004.**

Community forest (1)	No of FUGs (2)	Total CF in ha (3)	Total # of HH (4)	Total area % (5)	Total HH % (6)
less than 10 ha	2736	13,932.70	185,261	1.2	11.8
10 to 50 ha	5227	135,069.23	489,733	11.9	31.1
50 to 100 ha	2553	179,912.03	314,356	15.8	20.0
100 to 200 ha	1882	260,911.95	272,579	22.9	17.3
200 to 500 ha	1099	321,340.64	233,304	28.2	14.8
500 to 1000 ha	210	141,362.74	58,195	12.4	3.7
more than 1000 ha	51	86,683.71	21,883	7.6	1.4
<b>Total</b>	<b>13758</b>	<b>1139213</b>	<b>1304614</b>	100.0	100.0
<b>Gini coefficient</b>					0.445

Source: Author's computation from National FUG database, DoF, 2004.

**Table 2: Statistics related with community forests in Nepal.**

Community forest group (1)	Average CF in ha. (2)*	# HH in FUG (3)**	Per HH Forest in ha. (4)***
less than 10 ha	5.09	67.71	0.08
10 to 50 ha	25.84	93.69	0.28
50 to 100 ha	70.47	123.13	0.57
100 to 200 ha	138.64	144.83	0.96
200 to 500 ha	292.39	212.29	1.38
500 to 1000 ha	673.16	277.12	2.43
more than 1000 ha	1699.68	429.08	3.96

Obtained from Table 1 dividing

\* Column 3 by column 2

\*\* Column 4 by column 2

\*\*\* obtained by dividing column 2 of table 2 by column 3 of the same table.

authority should initiate the practice of calculating *Gini coefficient* of community forest distribution in Nepal and compare whether community forests are becoming more inequitable.

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**Annex 1: Calculation of Gini coefficient of CF distribution by size of the forest.**

Size of CF	No of forest	Total area (ha)	Total # of HH
less than 10 ha	2736	13,932.70	185,261.00
10 to 50 ha	5227	135,069.23	489,733.00
50 to 100 ha	2553	179,912.03	314,356.00
100 to 200 ha	1882	260,911.95	272,579.00
200 to 500 ha	1099	321,340.64	233,304.00
500 to 1000 ha	210	141,362.74	58,195.00
more than 1000 ha	51	86,683.71	21,883.00
<b>Total</b>	<b>13758</b>	<b>1139213</b>	<b>1575311</b>

Community forest group	Total area (%)	Total HH (%)	$\sum X_i$	$\sum Y_i$	$\sum X_i (Y_{i+1})$	$\sum (X_{i+1}) Y_i$
less than 10 ha	1.2	11.8	7.61	1.4	38.67938	27.80731
10 to 50 ha	11.9	31.1	20.02	5.1	398.2228	245.1435
50 to 100 ha	15.8	20.0	48.23	19.9	1793.808	1414.973
100 to 200 ha	22.9	17.3	71.13	37.2	4065.084	3233.146
200 to 500 ha	28.2	14.8	86.92	57.2	7669.852	5645.273
500 to 1000 ha	12.4	3.7	98.78	88.2	9877.699	8823.972
more than 1000 ha	7.6	1.4	100.00	100.0	0	0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>			<b>23843.34</b>	<b>19390.31</b>

$$G=1/(100)^2 (23843.34-19390.31)$$

$$\mathbf{0.445303}$$