

Social Data Verification

SOCIAL DATA VERIFICATION OF THE SMALL IRRIGATION PROGRAMME (SIP) – PHASE II



Innovative Circle Pvt. Ltd.

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Abbreviation

BCTN	Brahmin/Chettri/Thakuri/Newar
COVID-19	Coronavirus Disease-2019
DAG	Disadvantaged group
FGD	Focus group discussion
GoN	Government of Nepal
HH	Household
KIIs	Key informant interview
Lakh	A hundred thousand
LGs	Local governments
NPRS	Nepalese rupees
SDC	Swiss Agency for Development and Cooperation
SIP	Small Irrigation Programme
ToR	Terms of reference
PMISC	Programme management and implementation support consultant
PPR	Project preparation report
US\$	United States Dollars
WUAs	Water users associations

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EXECUTIVE SUMMARY

A verification of social data collected by the Small Irrigation Programme (SIP) was conducted in 21 irrigation schemes in 10 local governments of five mid-hills districts in Nepal's Province 1. The objective was to assess the accuracy of the social data reported, analysing and explaining any discrepancies between the SIP and verification data on households (HHs) that belong to disadvantaged groups (DAGs), and providing recommendations for improvement.

The project's definition of DAG HHs includes two major criteria: (a) socially discriminated¹ HHs, with an ethnic and gender dimension, and (b) food-sufficiency status. The verification collected data through focus group discussions (FGDs), key informant interviews (KIIs) and a structured HH questionnaire. FGDs and KIIs were conducted in all 21 sample schemes, whilst 445 HHs in 21 schemes responded to a HH survey. The verification study used as well a second definition to identify DAG HHs, which replaced the use of food-sufficiency status to identify poor HHs with an income threshold of US\$ (US dollars) 1.25 per person per day.

The verification study found 113 additional HHs in the 21 schemes it surveyed, compared to SIP data. Migration patterns, family changes and SIP data collection errors account for this 8% increase. There were no differences between SIP and the verification study in relation to social discrimination and gender: 71% of the HHs surveyed belong to discriminated castes, and 8% are female-headed HHs. However, the verification study did find 20% fewer HHs having food sufficiency for less than 6 months per year, compared to the SIP database. This discrepancy was explained by the difficulty of estimating the food sufficiency of individual HHs in a group discussion, the skills and capacity of the enumerators as well as communication issues. Due to this difference in food sufficiency, the verification study identified 12% fewer HHs as DAGs, compared to 58% of HHs identified as DAGs by SIP.

The verification study also compared the number of HHs characterised as DAG based on food sufficiency versus income status to determine which methodology is more accurate. It concluded that, when data collection is standardised and done correctly, either income status or food sufficiency can be used with social discrimination data to identify DAG HHs, with no significant difference; in both cases 48% of the HHs surveyed were characterised as DAGs.

Based on the study's analysis, it offers the following main recommendations:

- SIP should decide whether it is worthwhile to use income status rather than food sufficiency to estimate the percentage of DAG HHs per scheme, based on operational considerations.
- SIP should build the capacity of its enumerators and standardise data collection.
- SIP should take into consideration the findings of this verification study and from now on, adjust its reporting to consider the overestimation of DAG HHs. The average percentage of DAG HHs in its current schemes should be estimated at 46%, on average.

¹ Discriminated HHs belonging to Dalit, Janajati, Madhesi/Terai group, Discriminated Newar or other ethnic minorities are considered to be socially discriminated groups. Female-headed HHs, irrespective of ethnicity, are also considered socially discriminated groups.

INTRODUCTION TO SOCIAL DATA VERIFICATION

Project information

The Small Irrigation Programme (SIP) is implemented by all tiers of the Government of Nepal (GoN). The programme's second phase aims to benefit 65,000 farm households (HHs) by providing year-round irrigation on 20,000 hectares in about 1,300 small-scale irrigation systems through a community-driven process. The programme's expected outcomes are as follows: (i) Local governments (LGs) respond effectively to the needs of small farmers for irrigated agriculture; (ii) small farmers, especially from disadvantaged groups (DAGs), increase agricultural productivity; and (iii) market actors offer innovative support and products to farmers in the irrigated schemes. The programme is being implemented in 58 mid-hill rural municipalities of eight districts in Nepal's Province 1.

Background information

Social data are collected for SIP using focus group discussions (FGDs) and group meetings during the design of the irrigation schemes. SIP collects disaggregated data on total HHs, HHs belonging to DAGs, female-headed HHs and small-landholder HHs. A HH is identified as belonging to DAGs (see Figure 1) if it is both (a) socially discriminated based on ethnicity or the household is female headed irrespective of ethnic background, and (b) it has food sufficiency for less than 6 months per year from any source of production or income less than US\$ (US dollars) 1.25 per day per person. This categorisation can also be explained as follows:

- **Socially discriminated:** Ethnic and gender identity
 - i. Gender: Female-headed HHs of any ethnicity
 - ii. Ethnicity: HHs belonging to Dalits, Janajatis, Madhesi/Terai caste/ethnic groups or other minority groups
- **Economically poor:** Income or food sufficiency
 - iii. Poverty level: HHs that have food self-sufficiency for less than 6 months per year or earn less than US\$1.25 per person per day. SIP uses the indicator of HHs having food self-sufficiency for less than 6 months within the SIP command area.

The socially discriminated category is well defined. HHs belonging to this category can be identified in an objective manner through group discussion. The criteria for economic poverty, on the other hand, are more difficult to assess in a group setting. The food-sufficiency criterion, for example, requires a clear methodology and well-trained facilitators to ensure that the group making the assessment understand what is being measured and can determine HHs belonging to this category in an objective manner.

In discussions with SIP and for the purposes of this study, two definitions or approaches were used to characterise the economically poor:

- Current approach: DAG HHs are socially discriminated based on gender and/or ethnicity, and have food sufficiency for less than 6 months from food produced within the SIP command area.
- Approach based on income status: DAG HHs are socially discriminated based on gender and/or ethnicity, and have an income of US\$1.25 or less per person per day.

Objectives

The main objective of this social data verification is to determine the accuracy of the social data reported in SIP, identifying any discrepancies in the data and analysing the reasons for these. The specific objectives are to:

- Collect field data on total HHs, DAG HHs and small-landholder HHs for each sample scheme, based on the approach that the programme currently uses in its reporting.
- Analyse and verify the total HHs, DAG HHs and small-landholder HHs for all sample schemes against the data reported.
- Determine the DAG HHs based on the approach using income status, which includes both socially discriminated and economically poor indicators.

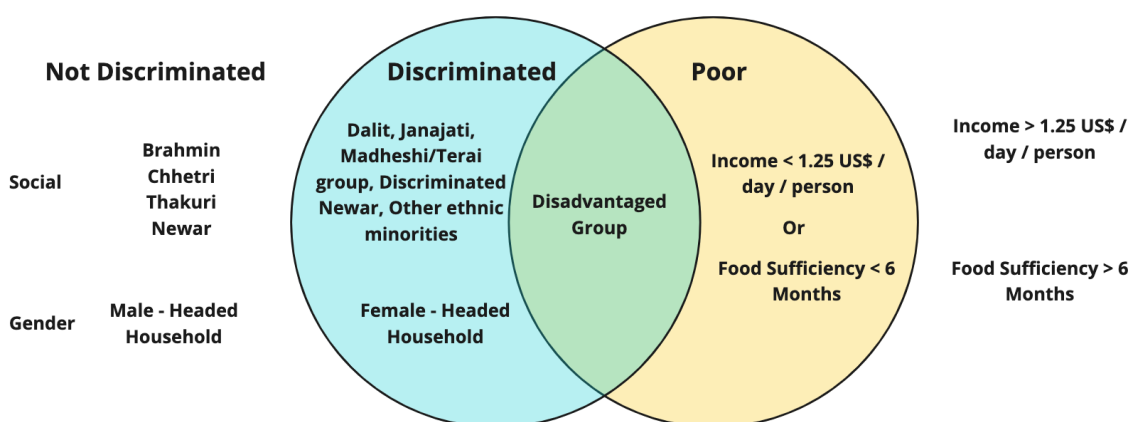


Figure 1. Characterisation of households belonging to disadvantaged groups.

Limitations

The total HH numbers were verified through participatory approaches – FGDs and key informant interviews (KIIs) – with water users association (WUA) members as well as other local respondents, including ward members, community members, lead farmers and/or local politicians. These respondents were chosen for their ability to recognise and characterise the beneficiary HHs of their irrigation scheme. It was assumed that FGD and KII participants could report on family size, land ownership, plot location, land size and food sufficiency for each HH in their scheme. As participants couldn't always define the land ownership of WUA members, surveys were used to verify some data.

The verification study used the same methodology to assess food sufficiency as that adopted by SIP. The programme currently collects data on food sufficiency through FGDs, assuming that participants know the food sufficiency of each HH. It is also assumed that HH survey respondents can accurately reflect their annual income from different sources and can quantify their agricultural and off-farm outputs in corresponding monetary terms.

Methodology

This analysis is based on a mixed qualitative and quantitative approach. Quantitative data were collected from a survey and compared with the SIP data for verification. Qualitative data were collected through FGDs and observations in the field. This study used two different methodologies to verify the social data, based on the two definitions given above (see Annex 1 for a more detailed presentation of the methodology).

Social data verification using focus group discussions and project approach

Background information

This section reports the social data that was verified through FGDs and KIIs, based on the SIP definition of DAGs as being socially discriminated based on gender and/or ethnicity, and having food self-sufficiency for less than 6 months in the SIP command area.

The SIP database includes 1,404 HHs from 21 schemes. The majority of HHs belong to the Janajati ethnic group (69%), followed by Brahmin, Chettri, Thakuri, Newar (BCTN) (21%), Dalit (7%) and other ethnic minorities (2%). About 8% of HHs are female headed, and 74% have food sufficiency for less than 6 months. In total, **58% of HHs are categorised as belonging to DAGs**, based on the SIP definition represented in Figure 1. Out of 21 sample schemes, 9 have more than 60% DAG HHs. Extracts from the SIP and verification survey database are presented in Annex 2.

Verification of the data using focus group discussions

Total household numbers: This verification analysis recorded 1,517 HHs in the 21 schemes. Table 1 presents the differences between the SIP database and the data collected for this verification study, showing an **8% increase compared to the SIP database**. The biggest difference was found in Khotang (16%) and the smallest in Okhaldhunga (4%).

FGD participants explained these differences as follows:

- Family changes and new HHs emerging in the districts
- Migrants entering or leaving the area
- Data collection errors
- New family settlement for a contract period
- *Adiya* practices

Table 1. Comparison of total household information with SIP database

Districts	No. of scheme	SIP HHs	FGD HHs	Difference in total HHs (%)
Khotang	3	112	130	16.1
Udayapur	4	339	379	11.8
Illam	5	339	369	8.8
Dhankuta	5	342	356	4.1
Okhaldhunga	4	272	283	4.0
Total	21	1,404	1,517	8.1

Social discrimination - Ethnicity and gender: There were no differences between the SIP data and that collected for verification regarding ethnicity or gender. However, a few mistakes in the spelling of names and surnames were found in the SIP database.

Economic status based on food sufficiency: The verification analysis found that 54% of the HHs had food sufficiency for less than 6 months (see Table 2), compared to 74% in the SIP database. **This is a 20% reduction**, with the biggest discrepancy found again in Khotang and the smallest in Udayapur.

Table 2. Comparison of food sufficiency information with the SIP database

Districts	Total HHs	SIP report Food sufficiency < 6 months	Verification	Difference (%)
Khotang	112	78	44	43.6
Okhaldhunga	272	225	132	41.3
Ilam	339	253	181	28.5
Dhankuta	342	261	209	19.9
Udayapur	339	227	190	16.3
Total	1,404	1,044	756	
Percentage		74.3	53.8	20.5

FGD participants explained some of these differences as follows:

- SIP enumerators had different levels of **understanding** on how to estimate food sufficiency status, which is based on the area of cultivated land per HH. However, it was not clear to FGD participants what land should be considered for the assessment; some believed this was only the land in the irrigation scheme and others that it was the total land area.
- There were difficulties in **communication** (i.e., language barriers) during SIP data collection. For example the Sherpa community could not understand the dialect of the enumerators.

Total percentage of DAG HHs: The verification analysis found that 46% of the HHs benefiting from irrigation schemes can be categorised as DAGs, based on social discrimination and food sufficiency (see Figure 1). **This is a 12% reduction** compared to the SIP database, which is explained by the 20% reduction in food sufficiency between the verification data and SIP database.

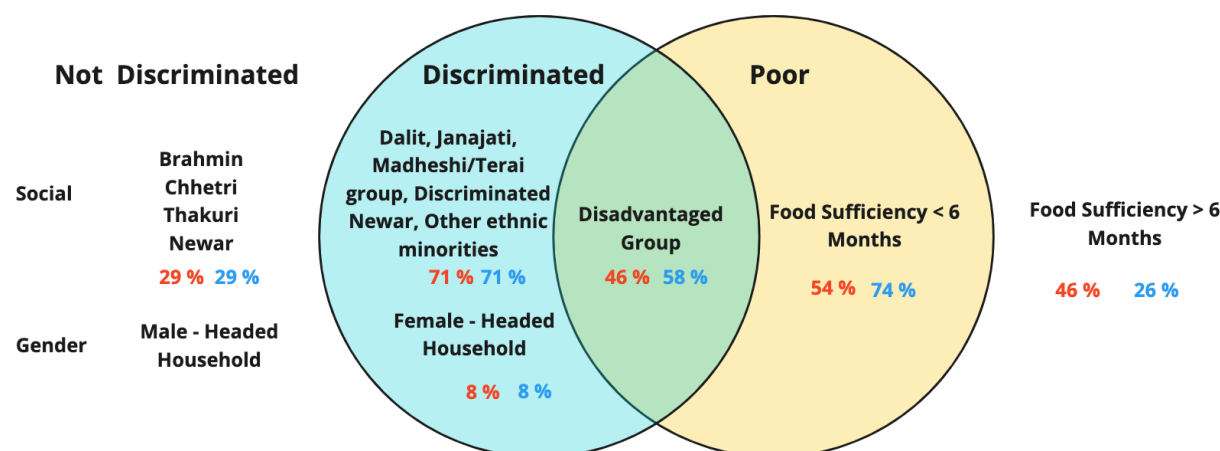


Figure 2. Disadvantaged group households as characterised by focus group discussions. Data from the verification study are presented in red and from SIP records in blue.

Social data verification using the income and food sufficiency survey approaches

Demographic information on the population sample

In 21 irrigation schemes, the study surveyed a total of 445 HHs, of which 386 were already included in the SIP database and 59 were new². Detailed demographic information is presented in Table 3.

Table 3: Demographic information from the questionnaire survey

Demographic variables	Frequency	Percentage
District		
Dhankuta	91	20.4
Udayapur	121	27.2
Okhaldhunga	70	15.7
Khotang	53	11.9
Illam	110	24.7
Total	445	100
Ethnicity		
Brahmin/Chettri/Thakuri/Newar (BCTN)	104	23.4
Dalit	53	11.9
Janajati	276	62.0
Other ethnic minorities	12	2.7
Total	445	100
Head of family³		
Male	396	89.0
Female	49	11.0
Total	445	100
Food sufficiency		
Less than 6 months	235	52.8
6 months	126	28.3
More than 6 months	84	18.9
Total	445	100

Key characteristics of the surveyed HHs are presented below.

Family size: The surveyed HHs had an average of 5.3 family members. A large proportion of these HHs (188) had 4 to 5 family members, followed by those with 6 members (70 HHs), 3 members (51) and 7 (47).

Landholding size: Most HHs in Okhaldhunga (91%) own less than 0.5 hectares of land, compared to 85% in Khotang, 83% in Udayapur, 69% in Illam and 40% in Dhankuta.

² New HHs consist of family members living in different HH structures after separation of families and whose names were not found in the SIP database.

³ Head of family refers to a position of authority within the family lineage. As a minimum criterion, SIP explained this on the basis of land ownership.

Annual income: The average annual income of the 445 HHs (in Nepalese rupees) was NPR 354,347. It was found that 54% of all HHs have an annual income of less than 3 lakhs (hundred thousand) rupees. Similarly, 26% of HHs have an annual income of NPR 3 lakhs to 6 lakhs, and only 7% of HHs have an annual income of NPR 9 lakhs and above. The annual total HH income was converted⁴ to US\$ per day per person.

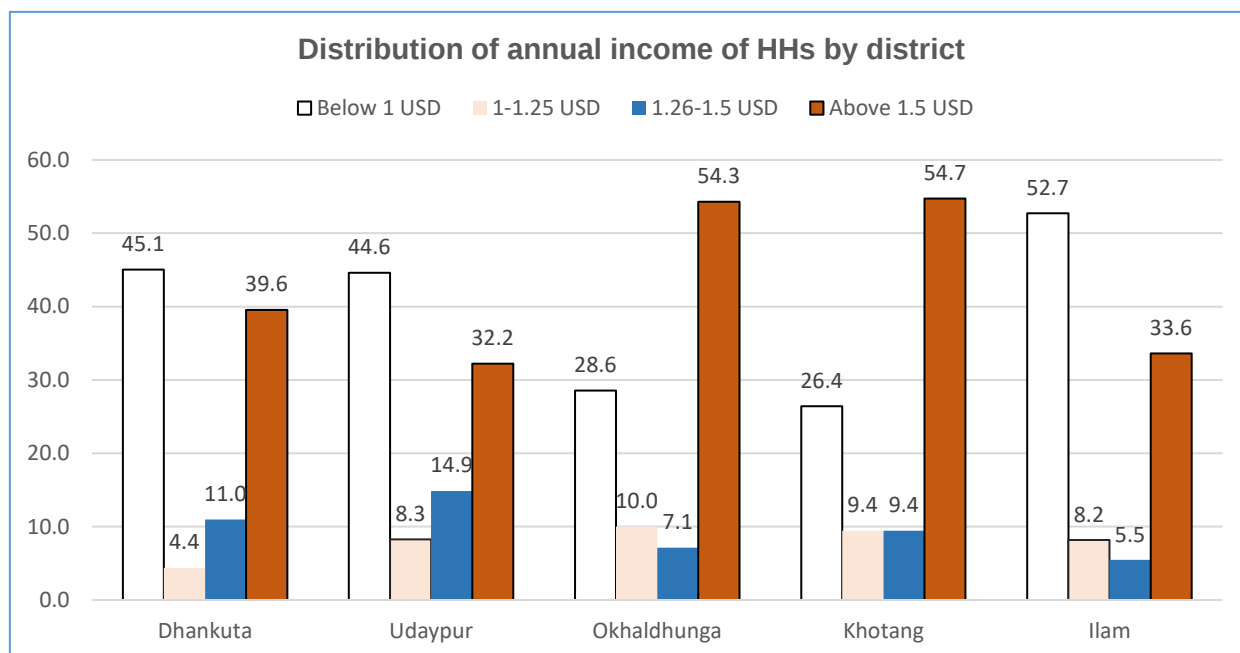


Figure 3: Distribution of household annual income by district.

Distribution of annual total household income by district and income size is shown in Figure 3. In three districts, more than half of the HHs earn more than US\$1.25 per day per person – Okhaldhunga (61%), Khotang (64%) and Dhankuta (51 %) – compared to 47% in Udayapur and 39% in Ilam. Interestingly, there is no correlation between land size and income; Khotang and Okhaldhunga have the highest percentage of HHs with less than 0.5 hectares of land but also the highest income. This indicates that a large component of HH income in these two districts does not come from the sale of agricultural products.

Major sources of annual income: The major income sources, in order of importance, are wage and employment, sale of livestock and fish, sale of other agricultural products, remittances, income from business and others (see Figure 4). Interestingly, the major source of income is own consumption of food, accounting for NPR 90,933. The data shows that most HHs have mixed incomes⁵. The least amount of income received (NPR 13,041) came from other sources, including social security benefits, such as old-age or disability pensions and single-women's allowances received by the family.

⁴The total HH income received from all sources was divided by 365 days and by the total number of family members. Total income was converted into US\$ at US\$1 = NPR 125, as of 24 June 2022.

⁵Mixed incomes include contributions from land productivity, family labour on the land, technology and profit (i.e., total revenue minus total cost). This was calculated on the basis of outputs used to produce on the land with traditional farming techniques and family labour.

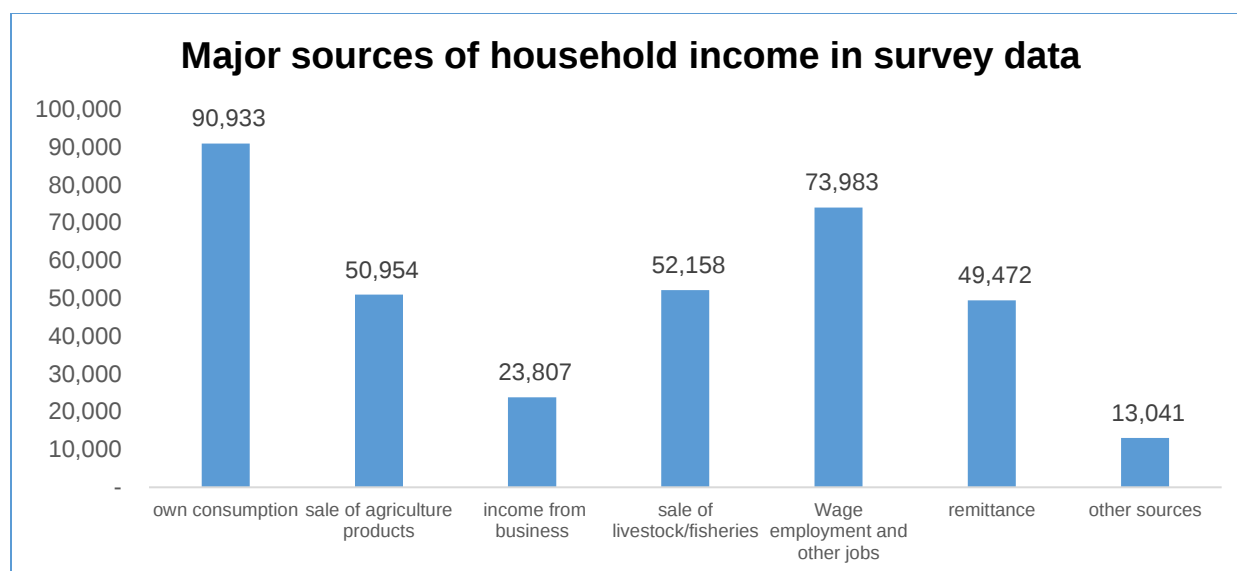


Figure 4. Major sources of household annual income in survey data.

Household characterisation based on social discrimination

Most of the 445 HHs surveyed belonged to the Janajati group (62%), followed by BCTN (23.4%) and other ethnic minorities (3%). About 11% of HHs were female headed. Of the survey respondents, most of the Janajati group resided in Illam (78%), whilst the least resided in Okhaldhunga (29%). In Udayapur, about 14% of HHs were female headed, whilst only 5% of female-headed HHs were found in the schemes in Dhankuta. Female-headed BCTN HHs numbered only 6 out of the 445 HHs surveyed.

Table 4: Socially discriminated households in survey data

Districts	BCTN	Dalit	Janajati	Other ethnic minorities	Female-headed HHs	No. of HHs
Dhankuta	28 (30.8%)	0	63 (69.2%)	0	4 (4.4%)	91
Udayapur	10 (8.3%)	29 (24%)	82 (67.8%)	0	17 (14%)	121
Okhaldhunga	37(52.9%)	13 (18.6%)	20 (28.6%)	0	9(12.9%)	70
Khotang	18 (34%)	10 (18.9%)	25 (47.2%)	0	7 (13.2%)	53
Illam	11 (10%)	1 (0.9%)	86 (78.2%)	12(10.9%)	12 (10.9%)	110
Total	104 (23.4%)	53 (11.9%)	276 (62%)	12 (2.7%)	49 (11%)	445

Household characterisation based on poverty level

Income status: Of the 445 HHs surveyed, half (49.9%) had an income of less than US\$1.25 per day per person. Illam had the highest percentage of poor households and Khotang the least (see Table 5).

Table 5. Characterisation of poor households based on income and food sufficiency

Districts	No. of HHs with less than US\$1.25/person/day	% of HHs with food sufficiency < 6 months	Total no. of HHs surveyed
Dhankuta	45 (49.5%)	53 (58.2%)	91
Udayapur	64 (52.9%)	59 (48.8%)	121
Okhaldhunga	27 (38.6%)	32 (45.7%)	70
Khotang	19 (35.8%)	20 (37.7%)	53
Ilam	67 (60.9 %)	71 (64.5%)	110
Total	222 (49.9%)	235 (52.8%)	445

Food-sufficiency status: 235 HHs (53%) indicated that they had food sufficiency for less than 6 months from all the land they own, including the SIP command area. Ilam had the highest percentage of poor HHs based on food sufficiency and Khotang the least (see Table 5).

Determination of discriminated group households based on social discrimination and poverty status

The DAG HHs were characterised based on two definitions: income and food-sufficiency status from all the land owned. On average, **48% of the HHs surveyed were identified as DAG HHs. Overall, the difference between the DAG HHs identified by food sufficiency versus income level was negligible at 0.5%.** The highest percentage of DAG HHs were found in Ilam and the lowest in Okhaldhunga (based on income status) and Khotang (based on food-sufficiency status). Although there are differences for the two definitions at the district level, these differences average each other for the total.

Table 6. Disadvantaged group households determined according to income and food sufficiency as well as socially discriminated status

Districts	DAG HHs - Income	DAG HHs - Food sufficiency	Total no. of HHs surveyed
Dhankuta	37 (40.7 %)	42 (46.2 %)	91
Udayapur	66 (54.5 %)	64 (52.9 %)	121
Okhaldhunga	22 (31.4 %)	21 (30 %)	70
Khotang	22 (41.5 %)	15 (28.3 %)	53
Ilam	66 (60 %)	73 (66.4 %)	110
Total	213 (47.8 %)	215 (48.3 %)	445

Comparison of disadvantaged group households with SIP database for a limited number of common households

The following analysis is limited to the 386 HHs that are common to the SIP database and the data collected for this survey. The verification study, which is limited to these 386 HHs, found that **44% of the HHs belonged to DAGs based on food sufficiency status and 47% based on income status.** For the same 386 HHs, the **SIP database identifies 56% as belonging to DAGs based on food-sufficiency status.** The SIP database and data verification study identified the same household as DAG – there is an exact match between both databases – in 73% of the

cases. The biggest difference between the verification and SIP data was reported for Khotang District and the smallest for Dhankuta.

Table 7. Comparison of SIP and verification data based on the two parameters used to determine poverty level (The symbol Δ indicates the difference between the SIP data and that collected by the verification survey.)

	% of DAG HHs (SIP)	% of DAG HHs (income)	% of DAG HHs (food suff.)	Δ SIP/Inc.	Δ SIP/FS	N
Dhankuta	49%	39%	45%	10%	4%	84
Udaypur	64%	57%	46%	7%	18%	102
Okhaldhunga	37%	29%	27%	8%	10%	63
Khotang	47%	40%	23%	6%	23%	47
Ilam	72%	59%	63%	13%	9%	90
Total	56%	47%	44%	9%	12%	386
Max.	72%	59%	63%	13%	23%	102
Min.	37%	29%	23%	6%	4%	47
Average	56%	47%	44%	9%	13%	77

Small landholders verification: The data on landholding for 307 HHs (80%) is an exact match with the SIP data. The reasons for land size discrepancy are shown in Table 8.

Table 8: Reasons for land size discrepancy in the SIP database

Reasons	Frequency	Percentage
Mistake in previous data collection	53	67
Land size reduced due to separation of family members	9	11
Decrease due to construction of home, roads, etc.	4	5
Land sold	2	3
Others	11	14
Total	79	100

Analysis of the correlation between social and economic status

A simple statistical analysis was conducted, using pivot table in Excel, to evaluate the correlation between social discrimination (based on caste and gender data) and the economic status (based on income or food sufficiency) of the HHs. This analysis was done using the raw data from BCTN, Janajatis and Dalit HHs surveyed during the verification survey to test the assumption that males and non-discriminated castes are better off than female and discriminated castes (see Table 9). In the SIP area, BCTN male-headed HHs had the highest income and food sufficiency, compared to Janajati or Dalit. As well, BCTN female-headed HHs were poorer and had less food sufficiency than their male counterparts. This final observation, despite the small sample size for female-headed households, confirms ongoing gender inequality in rural areas of Nepal.

Table 9. Correlation between social discrimination and poverty level based on the HHs surveyed

Poverty status	< US\$1.25	> US\$1.26	< 6 months	> 6 months
Brahmin/Chettri/Thakuri/Newar	31%	69%	39%	61%
Male (n=98)	29%	71%	39%	61%
Female (n=6)	67%	33%	50%	50%
Janajati	56%	44%	62%	38%
Male (n=247)	55%	45%	59%	41%
Female (n=28)	61%	39%	78%	22%
Dalit	60%	40%	56%	44%
Male (n=44)	61%	39%	56%	44%
Female (n=9)	56%	44%	54%	46%

Conclusions and recommendations

Conclusions

The objective of this verification exercise is to gauge the accuracy of the social data reported by SIP (based on the target and definition in the programme document), analysing and explaining any discrepancies, and recommending any actions needed to reduce errors in data collection. The **percentage of DAG HHs in the SIP area is 46% according to the verification survey and 58% in the SIP database.** The reasons for this discrepancy are discussed below. The analysis confirmed as well that most **discriminated castes and women have less income and less food sufficiency than the rest of the community.**

Accuracy of SIP data - Focus group discussions

Total number of households: An 8% difference was found between the total number of SIP-reported HHs and those identified by this verification study. FGD participants explained that this difference was due to migration patterns, evolution of family structure in the areas as well as data collection errors. We conclude that this 8% difference is due to natural evolution of the population in a given region and should not be an issue of concern for SIP.

Social discrimination: An analysis of the FGD responses found no difference between SIP data and that of the verification study on social discrimination based on caste and gender. We conclude that SIP is collecting accurate data on social discrimination and gender.

Food sufficiency: There is a 20% difference – a large discrepancy – between the food sufficiency data reported by SIP and that reported in this verification study. The main reasons for this difference concern methodological, communication and capacity issues as well as some data collection errors. During group discussions, the verification study team found as well that food-sufficiency status is difficult to assess in a group setting, as it is subjective and responses vary depending on the timing of the discussion.

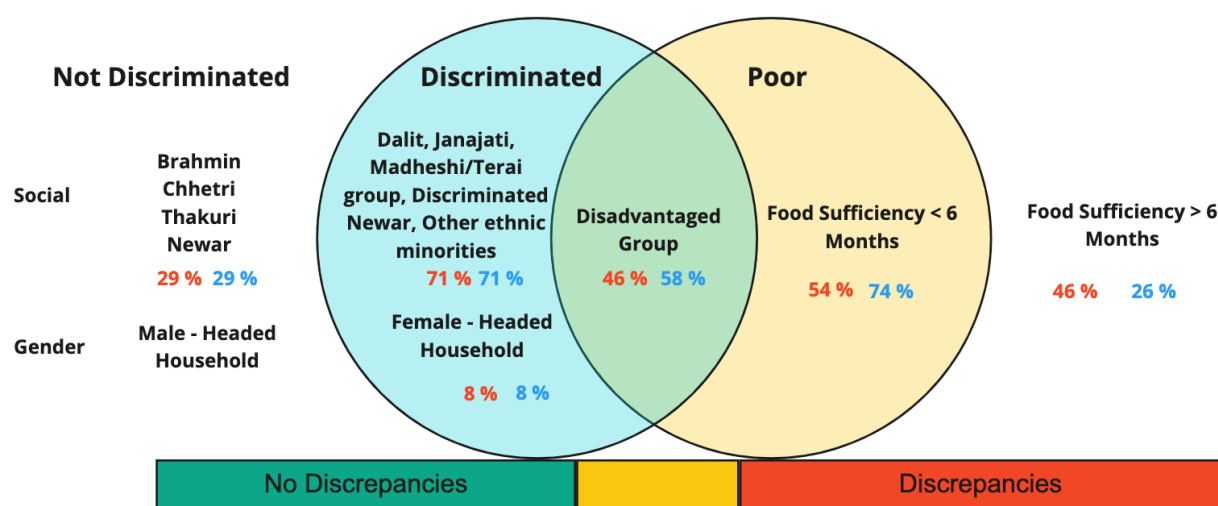


Figure 5. Discrepancies between SIP data and verification data.

Disadvantaged groups: As shown in Figure 5, the HHs belonging to DAGs are identified based on social discrimination data and poverty level. The 12% difference in DAG HHs between the SIP

data (58%) and verification data (46%) is explained by discrepancies in the data for food-sufficiency level, as discussed earlier.

Accuracy of SIP data - Survey

Analysis of survey results for the 386 HHs that were both included and identifiable in the SIP database, and that were surveyed once again for this study indicates that SIP has identified **12% more DAG HHs in its project area than did the verification study**. This is consistent with findings from the FGDs, indicating that the discrepancies are explained by capacity issues in collecting and collating data, communication issues between the interviewer and respondent, the complex and subjective nature of assessing food-sufficiency status, and demographic changes in the target population.

Small landholders: The SIP database and verification survey show an 80% match with regard to land size (i.e., 80% of HHs have identical land size, when the databases are compared). The main reasons for the discrepancy are data collection errors (67%), decreases in land size due to separation of family members (11%), a decrease due to construction (5%) and others (14%).

Illam: The eastern district of Illam is often considered a good model of social and economic development. However, according to the data collected by SIP and the verification survey, the SIP schemes in Illam have a high percentage of DAG HHs. This finding contradicts national statistics on social and economic development, and indicates that the SIP schemes are placed in rural areas where there are pockets of poverty.

Income versus food sufficiency to determine poverty status

To assess the difference between the two approaches in determining the poverty status of a HH, the data collected for 445 HHs by the verification survey was analysed (Table 6). Both approaches, using either income status or food sufficiency, reached the same conclusion, with 0.5% accuracy: 48% of the HHs surveyed are disadvantaged.

In conclusion, when data collection is standardised and correctly implemented, either income status or food sufficiency can be used with social discrimination data to identify DAG HHs. The food sufficiency and income status criteria can be used interchangeably. Food sufficiency can be collected quickly using FGDs, but its accuracy depends on the methodology, skills of the enumerator and perceptions of group participants. Data on income status can be collected more accurately, but this is best done through HH surveys, making it more time-consuming and expensive. The choice between one approach and the other should depend on operational and not conceptual considerations.

Recommendations

Discuss and decide: It is recommended that SIP discuss internally and decide whether it is worthwhile to use income status rather than food sufficiency to estimate the percentage of DAG HHs per scheme. SIP should consider that estimating individual income status through group discussion is difficult and ethically questionable. If the programme decides to change its approach and use income status, then it will need to review its data collection method and consider the cost and time required to do so. Our advice is to keep the current approach but improve its implementation by accepting the operational recommendations below.

Operational recommendations

Capacity building for enumerators: SIP should standardise and develop a manual⁶ for data collection. The results of this verification indicate different levels of accuracy, depending on the district where the data is collected. To improve the overall quality of the data, the methodology for determining food sufficiency needs to be better defined. Refresher training for enumerators in Khotang and Dhankuta is advisable. SIP should ensure as well that all enumerators are aware of the need to take into consideration the total area of arable land on a farm when defining food-sufficiency status.

Increased coverage: SIP should consider the demographic changes that this analysis has found. The verification survey has shown that, due to natural population movement, there are today 8% more HHs in the SIP schemes than previously estimated. It is recommended that SIP take this increase into consideration during planning and analyse whether it has any impact on targets, costs or operations.

Data standardisation: It is recommended that SIP take into consideration the findings of this verification study and adjust its reporting from now on to take into account the overestimation of DAG HHs. The percentage of DAG HHs in its current schemes should be estimated at 46%, on average.

⁶ The manual can be used as a practical guide for orienting enumerators and project staff in calculating income and measuring food-sufficiency status. It should also cover the survey questionnaire, giving examples of income and food sources in local contexts, and providing answers to frequently asked questions. The manual should further explain how the monetary value of similar farm products matters differently in different local contexts.

Annex 1: Social data verification methodology

Social data verification design

The social data verification survey adopted a mixed approach of qualitative and quantitative design- where numeric data were collected from a sample-based questionnaire survey and was compared with the SIP data for a generalization process, an inductive reasoning approach to verify overall social data. The assumptions for generalization process included: (a) a review of local contexts - ecological, demographic, ethnicity, socio-economic status, (b) project's previous strategy and a definition of DAGs using income and food sufficiency survey approach, and (c) inductive methodological approach. Thus, the overall study design was based on the two-way methodological flow of deductive and inductive reasoning⁷. Further a rigorous design of data collecting instruments such as (a) questionnaire survey, (b) focus group discussion, and (c) field observations was also conducted. It utilized both primary and secondary sources of social data in the verification process.

The total HHs, DAG HHs, and smallholder HHs determined from a comparative analysis is comparable with similar ethnic diversity, distribution of population size, and socio-economic status. Selection of WUAs was an initial basis to adjust in the overall verification process. The indicators used by SIP to determine DAG HHs and other indicator to determine DAGs were considered in this verification.

Social data verification approach

The study adopted two different methodologies to verify the social data. As study intended to collect DAGs information based on two different definitions, i.e., one used by SIP currently and secondly the DAGs using the income and food sufficiency approach, two separate approach was used (See Figure 6).

Data verification using focus group discussions and project approach

For the HHs and DAG HHs verification, the consultant team adopted participatory tools such as FGDs. During the FGDs or KIIs, the validity of total HHs were confirmed as participants discussed whether or not farm level outputs of each HH is sufficient to feed the family for 6 months. The respondents, such as WUA chairperson, secretary, treasurer, ward chairperson, local leaders, and municipality officials, could recognize the HHs characteristics. They also verified the total number of HH beneficiaries of their schemes, size of land ownership, female family heads, and ethnical background and food sufficiency status of each HH. Overall, SIP's database on total HHs was tallied with the consultant's findings. The consultant also explored the possible reasons of social data discrepancy, if any.

⁷ Inductive reasoning refers to making inferences moving from specific premises to the general conclusion, while the reverse is deductive.

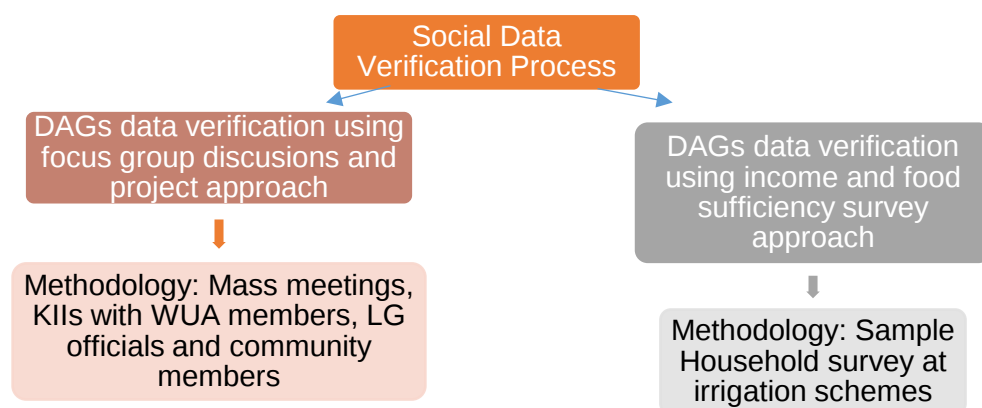


Figure 6: Social data verification process.

Social data verification using the income and food sufficiency survey approach

For the verification of social data using the income and food sufficiency survey approach, HH survey was conducted. For this, the consultant reviewed and utilized SIP social data. Moreover, the consultant also used the questionnaire survey to determine the DAG HHs and proportion/percentage of DAG HHs and small landholders in the sample scheme. As a way forward of social data verification process, the consultant strategically compared the SIP-database with survey findings of income or poor status, food sufficiency from all agriculture land of HHs, and socially discriminated background.

DAG determination from comparative analysis: The two-line criteria- (a) reference of socially discriminated background or female HHs head, and (b) HH status of income level of 1.25 US\$/day/person or 6 months food sufficiency from all agriculture land were the major benchmarks to determine the DAG HHs. Similarly, farm size below 0.5 hector of land ownership was the basis to determine small landholders. In the verification process of SIP data, the consultant considered⁸ only an outstanding match (above 90%) and highly reliable match (above 80%) with survey data of total HHs, DAG HHs, and small landholder HHs. After DAG HHs determination, the consultant developed a scenario analysis as per the local contexts to identify an overall proportion of DAG HHs and small landholder HHs.

Data collection

The study administered a rigorous design of data collecting instruments (see Figure 6): (a) questionnaire survey, (b) focus group discussion, and (c) field observations. It utilized both primary and secondary sources of social data in the verification process.

Review of relevant documents

The consultant reviewed SIP's social database, SIP-project definitions of DAGs and smallholders, project target groups, HH information, and other relevant documents. The consultant also reviewed and checked the statistical and non-statistical errors that prevailed at the SIP-reported DAGs information.

⁸ As the SIP database was compiled a few years ago, the consultant presumed in advance the structural social changes including a change in the total HHs and DAG HHs, besides a margin of error in actually taking a decision.

Mass meeting, observation, and key informant interviews

The total HH beneficiaries of the sample irrigation schemes were verified based on the information generated from FGDs and KIIs. The social data collection process started from FGDs with WUAs, an on-site field observation, and a few KIIs with possible respondents in each sample irrigation scheme. The details of participatory approach are presented in Table 10, below:

Table 10: Total number of participatory tools

Districts	FGDs/Mass Meeting	On-site Observation	KIIs	Total Sample Verification Events
Okhaldhunga	4	4	8	16
Khotang	3	3	6	12
Udayapur	4	4	8	16
Dhankuta	5	5	10	20
Ilam	5	5	10	20
Total	21	21	42	84

Questionnaire survey

Based on the study questions and objectives, a structured questionnaire (see Chapter: Survey Questionnaire for Social Data Verification) was designed and used. The quantitative data were collected by enumerators using offline survey software (Kobo) loaded onto android computer tablets. In consultation with Programme Management and Implementation Support Consultant (PMISC), the data collection instruments and approaches were finalized, and the consultant followed the overall guidelines given by PMISC team to identify the HHs for survey locations. Though the primary sources of information were the main measures to verify the DAGs criteria, the consultant fully utilized the secondary sources provided by PMISC during the overall questionnaire survey process, data presentation and interpretation for a cross comparison of sample HHs status. Each sample beneficiary HH was interviewed to determine DAG HHs and small landholders' status, income status or food sufficiency status, and others.

Population, sample schemes and household elements

The size of population for this HH survey was a total of 447 irrigation schemes implemented in 57 municipalities of mid-hill districts of Province 1. A total of 445 HHs sample from 21 irrigation schemes in 10 municipalities of five selected project districts were randomly selected in this survey.

Sampling techniques

A four-stage multi-cluster sampling approach was adopted to get socio-economic status of the HHs. Out of eight mid-hills districts of Province-1, Okhaldhunga, Khotang, Udayapur, Dhankuta, and Ilam were randomly selected while 10 municipalities were purposively selected to make the field travel possible during the rainy season, where 3-5 sample irrigation schemes were taken into consideration in the first stage. As the assignment intended to verify the Total HHs, DAG HHs, and small landholders, PMISC suggested being purposive for the sampling approach and provided guidelines⁹. The second stage considered 10 municipalities: seven urban and three

⁹ Total HHs per irrigation scheme must be greater than 50; and reported DAG % must be greater than 40% for the sampling purpose suggested by PMISC.

rural. In the third stage, 21 sample irrigation schemes were selected with the considerations that each selected sample had: (a) reflection of overall district's social and economic contexts, (b) 50 HHs with above 40 percent DAG reported in the project, and (c) all weather road accessibility for field works. In the fourth stage, a simple random sampling approach was considered to identify the sample HHs. The consultant also reached new HHs that were not in the SIP data.

Sample size of household survey

Assuming that 50 percent of survey respondents had knowledge of survey questionnaires, p value at 50 percent level was derived. By using the following formula, the total sample size was

$$n = \frac{Z^2 p(p-1)}{d^2}$$

calculated as:

Where,

n = required sample size

Z = (1.96) Z score that corresponds to a confidence interval

p = (0.5) the proportion of the attribute

d = (0.05) per cent confidence level in decimal or 1- α = 95 percent

Assuming the eight mid-hills district as a single basket, we got 384 sample size from a population parameter analysis. Considering a 15 percent response error on 384 sample elements, a total of 442 sample HHs were selected for this HH survey. Distributing 442 sample proportionally, the actual sample size in district, municipality, and irrigation scheme are presented in Table 2:

Table 11: Distribution of sample municipalities, sample scheme and sample size

Clusters/LGs	Sample Schemes	Number of HHs	Weightage Proportion	Plan of Sample HHs	Actual Sample Size
Dhankuta	5	342	0.244	108	91
1. Chhathar Jorpati Rural Municipality	4	291	0.207	92	79
2. Dhankuta Municipality	1	51	0.036	16	12
Ilam	5	339	0.241	107	110
1. Ilam Municipality	2	131	0.093	41	41
2. Suryodaya Municipality	3	208	0.148	65	69
Khotang	3	112	0.080	35	53
1. Diktal Rupakot Majhuwagadhi Municipality	1	52	0.037	16	19
2. Rawabesi Rural Municipality	2	60	0.043	19	34
Okhaldhunga	4	272	0.194	86	70
1. Molung Rural Municipality	2	148	0.105	47	40
2. Siddhicharan Municipality	2	124	0.088	39	30
Udayapur	4	339	0.241	107	121
1. Belaka Municipality	1	75	0.053	24	31
2. Katari Municipality	3	264	0.188	83	90
Grand Total	21	1404	1	442	445
Sample proportion in sample schemes				31.48	31.67

The sample schemes were designed as per their weightage population proportion in total irrigation schemes. On the basis of urban and rural areas, sample schemes and sample DAG HHs were attributed to the municipality and district clusters. However, the condition of roads during the rainy season compelled the field team to slightly change the planned sample distribution for the municipality.

Field monitoring, data management and quality assurance

In order to conduct this survey effectively and accurately, the consultant recruited four qualified field researcher and enhanced their knowledge, understanding, and skills as required by the assignment objectives. The DAGs definitions, and terminologies, rapport building skills, data collecting techniques and its process, survey ethics, data quality management and so on were discussed. The consultant refined the survey questionnaires, interview guidelines and techniques after detailed consultations with the PMISC team. The consultant also used participatory approach to seek views of HH beneficiaries and, where appropriate, non-beneficiaries. The data from the survey software, scientific statistical tools loaded tabs, were extracted in excel for social data processing. The analysis involved a comprehensive examination through a cross-comparison of sample scheme with study variables- districts, ethnicity, food sufficiency status, HHs income, DAG HHs, etc., to obtain in-depth information. In order to ensure its quality commitments, a panel of research integrity and quality assurance was established to pay special attention to accuracy, delivering the highest quality of research insights throughout our engagements. Quality assurance mechanism for this project was laid on three pillars:

- a) Maintaining quality standards at each step of data collection,
- b) Monitoring the survey implementation in real field
- c) Evaluating the survey procedures.

Ethical protocols

As SIP was targeting to verify the total HHs, DAG HHs, and small landholders HHs of the sample scheme, the consultant elicited the potentially sensitive information about incomes and ethnicity. All kinds of ethical consideration, for instance, protection of personal information, voluntary participation and informed consent, confidentiality and anonymity of the participants, safety considerations and risk management, etc. were maintained during the entire process.

Survey questionnaire for social data verification

Surveyor detailName of the surveyor Surveyor contact number Date of survey **Scheme detail**

Survey code (Household ID).....

District name

☐ 1-Bhojpur ☐ 2-Dhankuta ☐ 3-Terathum ☐ 4-Udaypur ☐ 5-Okhaldhunga ☐ 6-Khotang ☐ 7-Ilam ☐ 8-Panchthar

Scheme ID.....

Scheme name.....

Municipality name

Ward number.....

Respondent detailName of respondent**write the full name of respondent* Respondent contact number

Gender of respondent

☐ Male ☒ Female ☐ Other

Ethnicity of respondent

☐ Brahmin/Chettri/Thakuri/Newar ☐ Dalit ☐ Janajati ☐ Madhesi/Terai group ☐ Discriminated Newars ☐ Other ethnic minorities ☐ Others

What is the basis of household survey?

☐ Reported as DAG household and also identified through FGD ☐ Reported DAG household and not identified through FGD ☐ Non DAG household previously reported Head of the family

☐ Male ☐ Female

Ethnicity of the head of family

☐ Brahmin/Chettri/Thakuri/Newar ☐ Dalit ☐ Janajati ☐ Madhesi/Terai group ☐ Discriminated Newars ☐ Other ethnic minorities ☐ Others

Total male in the household*

Total female in the household.....

Total Family size.....

Size of land within the SIP command area**write in ropani* reasons of discrepancy *If the area of land reported by the respondent and the area of land reported in SIP programme does not match, please specify the reason.*

Land ownership (SIP command area)

☐ Own (household head) ☐ Shared

Food sufficiency (from overall land owned by household including SIP command area)

**write in months*

☐ Less than 6 months ☐ 6 months ☐ More than 6 months

Status of annual income (in NPR)

annual own consumption income¹⁰

annual income from sale of agriculture¹¹ products.....

annual income from business.....

annual income from sale of livestock/fisheries¹².....

annual income from jobs.....

annual income from remittance.....

annual income from other sources.....

Total annual income¹³

Any comments/remarks*

¹⁰ It is treated as gross annual mixed income received from the calculated value of total agri-products, livestock and fisheries that were consumed by HHs members as they produce it from their own labor, land, capital, etc

¹¹ Income calculated of the total agri-products as gross annual income

¹² Income calculated of the total livestock and fisheries as gross annual income

¹³ It is not related only to agriculture and production in SIP irrigated area but the overall economic status of a HH

Reference guidelines for measurement of small landholders

Parameters of Smallholder	Criteria	Measurement (1 to rate for lower and 5 for higher strength)
Land Size / Farm size	Having less than 0.5 hector (a benchmark)	
Technology of production	Manual or labor intensive to advanced technological	
Own capacity of marketing	Poor to well managed	
Farm Administration capacity	Family members operates or hires	
Storage and processing capacity	Limited to fully available	
Annual income / transaction		

Note: Mean value less than 2.5 for the determination of smallholders.

Farm size less with <5 hectares (UNDP) in Nepal

Farmers with <2.5 hectares to 750 hectares = landless and marginal farmers

The definitions vary widely for what constitutes a smallholder or small-scale farm, including factors such as size, food production technique or technology, involvement of family in labour and economic impact. Smallholdings are usually farms supporting a single family with a mixture of cash crops and subsistence farming.

Annex 2: SIP and verification survey database

Review of the SIP-reported disadvantaged group households

Scheme Code	Name of the Irrigation Scheme	Percentage of HHs in Each Ethnic Group							% of SIP-Reported Female Head	% of SIP-Reported Food Sufficiency Status	% of SIP-Reported DAG	SIP-Reported Total HHs
		BCT &N	Janajati	Female Head from BCT N	Dalit	Madhesi / Terai Group	Discriminated Newars	Other Ethnic Minorities				
11003SI005	Aarubote Sinchai Yojana	46.8%	53.2%	2.1%	0.0%	0.0%	0.0%	0.0%	6.4%	70.2%	38.3%	47
11003SI015	Aasalekhola Lapchagau Sinchai Yojana	17.9%	53.6%	1.2%	0.0%	0.0%	0.0%	28.6%	20.2%	52.4%	41.7%	84
11009SI055	Aderi Jhimikhaad Bhuteni Sinchai Yojana	42.0%	40.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%	36.0%	20.0%	50
11009SI005	Katyangkholha Sinchai Yojana	0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	3.3%	100.0%	100.0%	92
11009SI025	Magetar IP	6.1%	93.9%	0	0.0%	0.0%	0.0%	0.0%	15.2%	100.0%	93.9%	66
10704SI011	Maalwase CIP	23.5%	74.5%	2%	2.0%	0.0%	0.0%	0.0%	13.7%	58.8%	47.1%	51
10703SI008	Siran Janatakulo Irrigation Project	16.5%	83.5%	1.2%	0.0%	0.0%	0.0%	0.0%	14.1%	76.5%	63.5%	85

10703SI013	Thodne Kulo Irrigation Project	53.4%	46.6%	0	0.0 %	0.0%	0.0%	0.0%	0.0%	62.1%	41.4 %	58
10703SI001	Phapre Khardep Surunge Canal IP	12.7%	86.1%	0	1.3 %	0.0%	0.0%	0.0%	10.1%	89.9%	81.0 %	79
10703SI003	Puchchhar Canal IP	11.6%	87.0%	0	1.4 %	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	69
10505SI007	Rajkulo Samatung Aahalekhet Irrigation Project	19.2%	67.3%	0	13.5 %	0.0%	0.0%	0.0%	1.9%	46.2%	44.2 %	52
10503SI018	Locha Khola Muhan Gari Khaireni Kulo Yojana	22.6%	45.2%	0	32.3 %	0.0%	0.0%	0.0%	6.5%	83.9%	71.0 %	31
10503SI017	Dube Khola Muhan Gari Rahutaar IP	55.2%	17.2%	0	27.6 %	0.0%	0.0%	0.0%	6.9%	96.6%	44.8 %	29
10402SI041	Argeli Taksar IP	31.7%	55.6%	9.5%	12.7 %	0.0%	0.0%	0.0%	27.0%	98.4%	76.2 %	63
10402SI002	Pokting Surke IP	0.0%	100.0 %	0	0.0 %	0.0%	0.0%	0.0%	11.5%	60.7%	60.7 %	61
10403SI011	Khalte Khola Phuyalgau Ghale Bada Sinchai Yojana	63.5%	34.9%	7.9%	1.6 %	0.0%	0.0%	0.0%	12.7%	71.4%	42.9 %	63
10403SI016	Tallotar Dalit Basti IP	55.3%	4.7%	3.5%	40.0 %	0.0%	0.0%	0.0%	3.5%	95.3%	48.2 %	85
11407SI027	Sana Sinchai Yojana Budhabudhi Patne	0.0%	92.2%	0	7.8 %	0.0%	0.0%	0.0%	0.0%	59.4%	59.4 %	64
11407SI014	Sombare Rana Kulo Baketaar	40.0%	42.0%	2%	18.0 %	0.0%	0.0%	0.0%	10.0%	40.0%	40.0 %	50

11407SI001	Singapore Sinchaikulo IP	0.7%	98.7%	1.3%	0.7%	0.0%	0.0%	0.0%	1.3%	66.0%	66.0%	150
11401SI023	Bhachuwa Ramite Sinchai Marmat Yojana	4.0%	74.7%	1.3%	21.3%	0.0%	0.0%	0.0%	12.0%	93.3%	92.0%	75
Total		301 (21%)	968 (69%)	22 (1.6%)	102 (7%)	0	0	24 (2%)	116 (8%)	1044 (75%)	820 (58%)	1404

Number of SIP-reported households and disadvantaged groups for verification using income and food sufficiency survey approach

Scheme name	Ethnicity					No. of Female headed HH	No. of HH Income Status less than 1.25/day per person	No of HH Survey Food sufficiency statuses	No of HH Survey reported DAG	No of HH SIP reported DAG	Total no of Survey reported HH
	BCTN	Dalit	No of female headed HH from BCTN	Janjati	Other ethnic minorities						
Aarubote Sinchai Yojana	1	0		18	0	1	11	9	6	17	19
Aasalekhola Lapchagau Sinchai Yojana	2	0		8	12	7	10	10	8	7	22
Aderi Jimikhaad Bhuteni Sichai Yojana	8	1	1	13	0	2	19	11	10	5	22
Argeli Taksar IP	5	6	1	5	0	3	10	9	6	10	16
Bhachuwa Ramite Sinchai Marmat Yojana	2	14		15	0	7	19	12	10	23	31
Dube Khola Muhan Gari Rahutar I.P.	10	5	1	1	0	1	5	11	3	5	16
Katyang Khola Sichai Yojana	0	0		18	0	0	10	14	9	12	18

Khalte khola phuyalgau ghale bada sichai yojana	17	0	1	1	0	1	5	12	1	1	18
Locha Khola Muhan Gari Khaireni Kulo Yojana	3	3		12	0	3	6	8	4	10	18
Maalwase CIP	0	0		12	0	0	10	11	9	7	12
Magetar IP	0	0		29	0	2	17	27	17	24	29
Phapre Khardep Surunge Canal irrigation project	5	0		8	0	0	4	4	1	5	13
Pokting Surke	0	0		14	0	5	3	5	5	7	14
Puchhar Canal Irrigation Project	0	0		23	0	2	16	14	13	15	23
Rajkulo Samatung Aahale Khet IP	5	2	1	12	0	3	8	1	2	7	19
Sana Sinchai Yojana Budhabudhi Patne	0	5		23	0	1	13	16	6	15	28
Singapore Sichai Kulo	0	1		35	0	5	23	19	14	21	36
Siran Janta Kulo Irrigation Project	2	0		15	0	2	8	11	5	10	17
Sombare Rana Kulo Baketar	8	9	1	9	0	4	9	12	7	6	26
Tallotar dalit basti IP	15	7		0	0	0	9	6	4	5	22
Thotne Kulo Irrigation Project	21			5	0	0	7	13	1	4	26
Total	104	53	6	276	12	49	222	235	141	216	445

SIP-reported households and disadvantaged groups for verification using income and food sufficiency survey approach (%)

Scheme name	Ethnicity										
	BCTN	Dalit	No of female headed HH from BCTN	Janjati	Other ethnic minorities	No. of Female headed HH	% of HH Income Status less than 1.25/day per person	% of HH Survey Food sufficiency status	% of HH Survey reported DAG	% of HH SIP reported DAG	Total no of Survey reported HH
Aarubote Sinchai Yojana	5.3%	0.0%		94.7 %	0.0%	5.3%	57.9%	47.4%	31.6%	89.5%	19
Aasalekhola Lapchagau Sinchai Yojana	9.1%	0.0%		36.4 %	54.5%	31.8%	45.5%	45.5%	36.4%	31.8%	22
Aderi Jimikhaad Bhuteni Sichai Yojana	36.4%	4.5%	4.5%	59.1 %	0.0%	9.1%	86.4%	50.0%	45.5%	22.7%	22
Argeli Taksar IP	31.3%	37.5 %	6.3%	31.3 %	0.0%	18.8%	62.5%	56.3%	37.5%	62.5%	16
Bhachuwa Ramite Sinchai Marmat Yojana	6.5%	45.2 %		48.4 %	0.0%	22.6%	61.3%	38.7%	32.3%	74.2%	31
Dube Khola Muhan Gari Rahutar I.P.	62.5%	31.3 %	6.3%	6.3%	0.0%	6.3%	31.3%	68.8%	18.8%	31.3%	16
Katyang Khola Sichai Yojana	0.0%	0.0%		100.0 %	0.0%	0.0%	55.6%	77.8%	50.0%	66.7%	18
Khalte khola phuyalgau ghale bada sichai yojana	94.4%	0.0%	5.6%	5.6%	0.0%	5.6%	27.8%	66.7%	5.6%	5.6%	18
Locha Khola Muhan Gari Khaireni Kulo Yojana	16.7%	16.7 %		66.7 %	0.0%	16.7%	33.3%	44.4%	22.2%	55.6%	18
Maalwase CIP	0.0%	0.0%		100.0 %	0.0%	0.0%	83.3%	91.7%	75.0%	58.3%	12
Magetar IP	0.0%	0.0%		100.0 %	0.0%	6.9%	58.6%	93.1%	58.6%	82.8%	29
Phapre Khardep Surunge Canal irrigation project	38.5%	0.0%		61.5 %	0.0%	0.0%	30.8%	30.8%	7.7%	38.5%	13
Pokting Surke	0.0%	0.0%		100.0 %	0.0%	35.7%	21.4%	35.7%	35.7%	50.0%	14
Puchhar Canal Irrigation Project	0.0%	0.0%		100.0 %	0.0%	8.7%	69.6%	60.9%	56.5%	65.2%	23
Rajkulo Samatung Aahale Khet Irrigation Project	26.3%	10.5 %	5.3%	63.2 %	0.0%	15.8%	42.1%	5.3%	10.5%	36.8%	19
Sana Sinchai Yojana Budhabudhi Patne	0.0%	17.9 %		82.1 %	0.0%	3.6%	46.4%	57.1%	21.4%	53.6%	28
Singapore Sichai Kulo	0.0%	2.8%		97.2 %	0.0%	13.9%	63.9%	52.8%	38.9%	58.3%	36

Siran Janta Kulo Irrigation Project	11.8%	0.0%		88.2 %	0.0%	11.8%	47.1%	64.7%	29.4%	58.8%	17
Sombare Rana Kulo Baketar	30.8%	34.6 %	3.8%	34.6 %	0.0%	15.4%	34.6%	46.2%	26.9%	23.1%	26
Tallotar dalit basti IP	68.2%	31.8 %		0.0%	0.0%	0.0%	40.9%	27.3%	18.2%	22.7%	22
Thotne Kulo Irrigation Project	80.8%	0.0%		19.2 %	0.0%	0.0%	26.9%	50.0%	3.8%	15.4%	26
Total	104 (23%)	53 (12%)		276 (62%)	12 (2.7%)	49 (11%)	222 (50%)	235 (53%)	141 (32%)	216 (49%)	445

Total households in the 21 sample schemes and focus group discussion findings

Name of the Municipality	Scheme Code	Name of the Irrigation Scheme	SIP-Reported Total HHs	FGD Findings of Total HHs
Ilam	11003SI005	Aarubote Sinchai Yojana	47	57
	11003SI015	Aasalekhola Lapchagau Sinchai Yojana	84	85
Suryodaya	11009SI055	Aderi Jhimikhaad Bhuteni Sinchai Yojana	50	52
	11009SI005	Katyangkholo Sinchai Yojana	92	96
	11009SI025	Magetar IP	66	79
Dhankuta	10704SI011	Maalwase CIP	51	58
Chhathar Jorpati	10703SI008	Siran Janatakulo Irrigation Project	85	87
	10703SI013	Thodne Kulo Irrigation Project	58	58
	10703SI001	Phapre Khardep Surunge Canal IP	79	79
	10703SI003	Puchchhar Canal IP	69	74
Diktel Rupakot Majhuwagadhi	10505SI007	Rajkulo Samatung Aahalekhet Irrigation Project	52	57
Rawabesi	10503SI018	Locha Khola Muhan Gari Khaireni Kulo Yojana	31	36
	10503SI017	Dube Khola Muhan Gari Rahutaar IP	29	37
Siddhicharan	10402SI041	Argeli Taksar IP	63	64
	10402SI002	Pokting Surke IP	61	64
Molung	10403SI011	Khalte Khola Phuyalgau Ghale Bada Sinchai Yojana	63	66
	10403SI016	Tallotar Dalit Basti IP	85	89
Katari	11407SI027	Sana Sinchai Yojana Budhabudhi Patne	64	72
	11407SI014	Sombare Rana Kulo Baketaar	50	59
	11407SI001	Singapore Sinchaikulo IP	150	151
Belaka	11401SI023	Bhachuwa Ramite Sinchai Marmat Yojana	75	97

Total	21	21	1,404	1,517
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Distribution of sample size and SIP command area's food-sufficiency status for less than 6 months

Name of the Municipality	Scheme Code	Name of the Irrigation Scheme	Sample Size of Survey	Municipality Total Sample	Food sufficiency <6 Months
Ilam	11003SI005	Aarubote Sinchai Yojana	19		33
	11003SI015	Aasalekhola Lapchagau Sinchai Yojana	22	41	44
Suryodaya	11009SI055	Aderi Jhimikhaad Bhuteni Sinchai Yojana	22		18
	11009SI005	Katyangkholo Sinchai Yojana	18		92
	11009SI025	Magetar IP	29	69	66
Dhankuta	10704SI011	Maalwase CIP	12	12	30
Chhathar Jorpati	10703SI008	Siran Janatakulo Irrigation Project	17		65
	10703SI013	Thodne Kulo Irrigation Project	26		36
	10703SI001	Phapre Khardep Surunge Canal IP	13		71
	10703SI003	Puchchhar Canal IP	23	79	57
Diktal Rupakot Majhuwagadhi	10505SI007	Rajkulo Samatung Aahalekhet Irrigation Project	19	19	24
Rawabesi	10503SI018	Locha Khola Muhan Gari Khaireni Kulo Yojana	18		26
	10503SI017	Dube Khola Muhan Gari Rahutaar IP	16	34	28
Siddhicharan	10402SI041	Argeli Taksar IP	16		62
	10402SI002	Pokting Surke IP	14	30	37
Molung	10403SI011	Khalte Khola Phuyalgau Ghale Bada Sinchai Yojana	18		45
	10403SI016	Tallotar Dalit Basti IP	22	40	81
Katari	11407SI027	Sana Sinchai Yojana Budhabudhi Patne	28		38
	11407SI014	Sombare Rana Kulo Baketaar	26		20

	11407SI001	Singapore Sinhaikulo IP	36	90	99
Belaka	11401SI023	Bhachuwa Ramite Sinchai Marmat Yojana	31	31	70
Total	21	21	445		1,044

Ethnicity distribution and food-sufficiency status calculated through the focus group discussions

Scheme name	Ethnicity				No. of Female Headed HHs	SIP Reported HHs with Food Sufficiency Status > 6 Months	FGD Highlights with Food Sufficiency Status < 6 Months	SIP Reported DAG HHs	SIP Reported Total HHs
	Brahmin/Chettri/Thakuri/Nevar	Dalit	Janjati	Other Ethnic Minorities					
Aarubote Sinchai Yojana	22	0	25	0	3	14	26	18	47
Aasalekhola Lapchagau Sinchai Yojana	15	0	45	24	17	40	40	35	84
Aderi Jhimikhaad Bhuteni Sinchai Yojana	21	0	20	0	0	32	21	10	50
Katyangkholo Sinchai Yojana	0	0	92	0	3	0	41	92	92
Magetar IP	4	0	62	0	10	0	53	62	66
Maalwase CIP	12	1	38	0	7	21	46	24	51
Siran Janatakulo Irrigation Project	14	0	71	0	12	20	52	54	85
Thodne Kulo Irrigation Project	31	0	27	0	0	22	27	24	58
Phapre Khardep Surunge Canal IP	10	1	68	0	8	8	47	64	79
Puchchhar Canal IP	8	1	60	0		12	37	57	69
Rajkulo Samatung Aahalekhet Irrigation Project	10	7	35	0	1	28	1	23	52
Locha Khola Muhan Gari Khairani Kulo Yojana	7	10	14	0	2	5	18	22	31
Dube Khola Muhan Gari Rahutaar IP	16	8	5	0	2	1	25	13	29
Argeli Taksar IP	20	8	35	0	17	1	30	48	63
Pokting Surke IP	0	0	61	0	7	24	18	37	61
Khalte Khola Phuyalgau Ghale Bada Sinchai Yojana	40	1	22	0	8	18	48	27	63
Tallotar Dalit Basti IP	47	34	4	0	3	4	36	41	85
Sana Sinchai Yojana Budhabudhi Patne	0	5	59	0	0	26	52	38	64
Sombare Rana Kulo Baketaar	20	9	21	0	5	30	19	20	50
Singapore Sinchaikulo IP	1	1	148	0	2	51	90	99	150

Bhachuwa Ramite Sinchai Marmat Yojana	3	16	56	0	9	5	29	69	75
Total	301	102	968	24	116	350	756	820	1,404

Disadvantaged group households calculated through focus group discussions in the sample irrigation schemes

Scheme name	SIP Reported Total HHs	SIP Reported HHs with Food Sufficiency Status < 6 Months	SIP Reported Total DAG HHs	FGD/KIIs Determined Total HHs with Food Sufficiency Status<6 Months	FGD/KIIs Determined BCTN HHs with Food Sufficiency Status<6 Months	FGD/KIIs Determined Other than BCTN HHs with Food Sufficiency Status<6 Months	FGD/KIIs Determined Total Female Headed BCTN HHs with Food Sufficiency Status<6 Months	FGD/KIIs Determined Female Headed BCTN DAG HHs	FGD/KIIs Determined Total DAG HHs
Aarubote Sinchai Yojana	47	33	18	26	12	14	2	1	15
Aasalekhola Lapchagau Sinchai Yojana	84	44	35	40	5	35	7	1	36
Aderi Jhimikhaad Bhuteni Sinchai Yojana	50	18	10	21	10	11	0	0	11
Katyangkholo Sinchai Yojana	92	92	41	41	0	41	0	0	41
Magetar IP	66	66	62	53	2	51	9	0	51
Maalwase CIP	51	30	24	46	8	38	6	0	38
Siran Janatakulo Irrigation Project	85	65	54	52	8	44	9	1	45
Thodne Kulo Irrigation Project	58	38	24	27	10	17	0	0	17
Phapre Khardep Surunge Canal IP	79	71	64	47	0	47	5	0	47
Puchchhar Canal IP	69	57	51	37	0	37	2	0	37
Rajkulo Samatung	52	24	23	1	0	1	0	0	1

Aahalekhet Irrigation Project									
Locha Khola Muhan Gari Khaireni Kulo Yojana	31	26	22	18	1	17	2	0	17
Dube Khola Muhan Gari Rahutaar IP	29	28	13	25	16	9	2	0	9
Argeli Taksar IP	63	62	48	30	5	25	7	1	26
Pokting Surke IP	61	37	37	18	0	18	0	0	18
Khalte Khola Phuyalgau Ghale Bada Sinchai Yojana	63	45	27	48	33	15	6	5	20
Tallotar Dalit Basti IP	85	81	41	36	7	29	1	1	30
Sana Sinchai Yojana Budhabudhi Patne	64	38	38	52	0	52	0	0	52
Sombare Rana Kulo Baketaar	50	20	20	19	5	14	0	0	14
Singapore Sinhaikulo IP	150	99	99	90	0	90	2	0	90
Bhachuwa Ramite Sinchai Marmat Yojana	75	70	69	29	1	28	3	1	29
Total	1404	1044	820	756	123	633	63	11	644

District name	HHs of Brahmin/Che ttri/Thakuri/N ewar	Dalit HHs	Janjati HHs	HHs of other ethnic minorities	No. of Female headed HHs	No. of HH Income Status less than 1.25/day per person	No of HHs with<6 months' Food sufficiency	No of HH reported DAG HHs by Survey	Total no of Survey reported HH
Dhankuta	30.8%	0.0%	69.2%	0.0%	4.4%	49.5%	58.2%	31.9%	91
Udaypur	8.3%	24.0%	67.8%	0.0%	14.0%	52.9%	48.8%	30.6%	121
Okhaldhung a	52.9%	18.6%	28.6%	0.0%	12.9%	38.6%	45.7%	22.9%	70
Khotang	34.0%	18.9%	47.2%	0.0%	13.2%	35.8%	37.7%	17.0%	53
Ilam	10.0%	0.9%	78.2%	10.9%	10.9%	60.9%	64.5%	45.5%	110
Total	104 (23%)	53 (12%)	276 (62%)	12 (2.7%)	49 (11%)	222 (50%)	235 (53%)	141 (32%)	216

Household income in the districts

Major source of income (Annual)	HH Income Amounts in the District (Thousands)					
	Dhankuta	Udaypur	Okhaldhunga	Khotang	Ilam	Total
Own Consumption Income	10,367	9,188	8,214	4,628	8,068	40,465
Income from Sale of Agriculture Products	7,087	3,497	4,340	2,524	5,226	22,674
Income from Business	1,920	3,675	1,655	1,990	1,354	10,594
Income from Sale of Livestock/Fisheries	5,143	4,404	4,852	2,714	6,098	23,210
Income from salary, wages, jobs	6,706	9,020	5,986	5,850	5,361	32,923
Income from Remittance	4,134	5,215	3,120	6,620	2,926	22,015
Other Sources	1,486	1,740	1,086	614	878	5,804

Per person income status in the districts surveyed

Sample Irrigation Schemes		Per Person (Derived from HH) Income Status			
	Below 1 US\$	1-1.25 US\$	1.26-1.5 US\$	Above 1.5 US\$	HH Total
Aarubote Sinchai Yojana	11	-	1	7	19
Aasalekhola Lapchagau Sinchai Yojana	10	-	-	12	22
Aderi Jimikhaad Bhuteni Sichai Yojana	17	2	-	3	22
Katyang Khola Sichai Yojana	8	2	2	6	18
Magetar IP	12	5	3	9	29
Total of Illam	58	9	6	37	110
Locha Khola Muhan Gari Khaireni Kulo Yojana	4	2	2	10	18
Dube Khola Muhan Gari Rahutar I.P.	3	2	1	10	16
Rajkulo Samatung Aahale Khet Irrigation Project	7	1	2	9	19
Total of Khotang	14	5	5	29	53
Siran Janta Kulo Irrigation Project	5	3	3	6	17
Maalwase CIP	9	1	1	1	12
Thotne Kulo Irrigation Project	7	-	1	18	26
Phapre Khardep Surunge Canal irrigation project	4	-	2	7	13
Puchhar Canal Irrigation Project	16	-	3	4	23
Total of Dhankuta	41	4	10	36	91
Pokting Surke	3	-	2	9	14
Tallotar dalit basti IP	6	3	3	10	22
Argeli Taksar IP	7	3	-	6	16
Khalte khola phuyalgau ghale bada sichai yojana	4	1	-	13	18
Total of Okhaldhunga	20	7	5	38	70
Sombare Rana Kulo Baketar	6	3	5	12	26
Bhachuwa Ramite Sinchai Marmat Yojana	17	2	3	9	31
Sana Sinchai Yojana Budhabudhi Patne	9	4	5	10	28
Singapore Sichai Kulo	22	1	5	8	36

Total of Udayapur	54	10	18	39	121
Grand Total	187	35	44	179	445