

Introduction

Rice is a staple food crop and a key component of food security and rural livelihoods. Accurate and location-specific yield information is essential for assessing the performance of rice production, guiding research and extension interventions, and supporting evidence-based planning at the district level. Crop cut experiments are widely recognized as a reliable method for generating objective and technically sound yield estimates under farmer's field conditions. In this context, a district-level crop cut study was conducted under the ARDC Bajo region using a purposive stratified random sampling framework to ensure representativeness across villages, altitude zones, and rice varieties. It covered both improved and locally adapted rice cultivars cultivated by farmers.

Objectives

1. To assess rice yield variation across different altitude zones (high, mid, and low) within Gewogs.
2. To document yield performance of both improved rice varieties and locally adapted native cultivars grown under farmers' conditions.
3. To provide evidence-based yield data to support research planning and extension strategies, in the ARDC Bajo region.

Methodology

Sampling procedure

Crop cut data collected should be representative, therefore, a purposive stratified random sampling method was adopted. Initially, from the list of villages under each gewog, villages cultivating rice were identified, and three villages were randomly selected. From each selected village, one farmer was randomly chosen for crop cut data collection, as illustrated in Figure 1. The three farmers were selected from different altitude zones (high, mid, and low), as categorized. In cases where a gewog fell under only one altitude zone (high, mid, or low), one sample per village per gewog was considered sufficient. Crop cuts were conducted on both improved and locally adapted native rice cultivars.

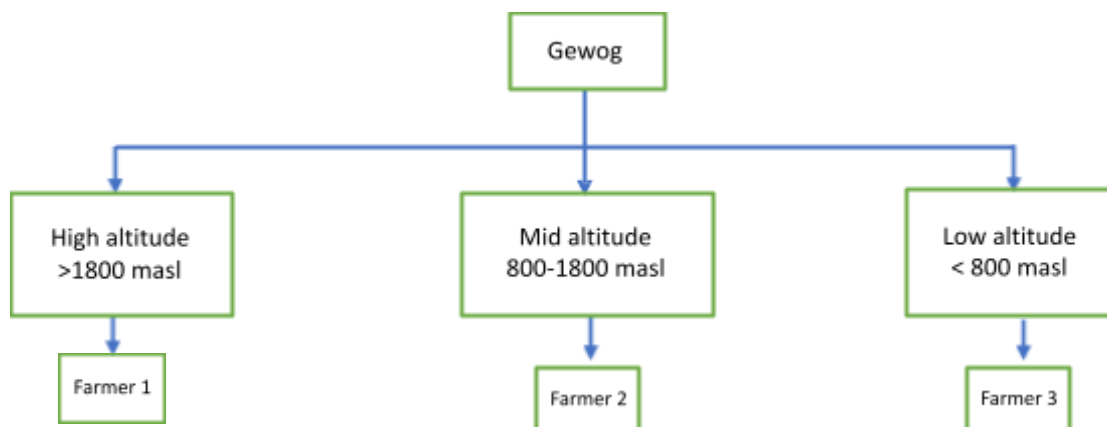


Figure 1. Sampling procedure for field crops

Locating and marking of plot

Three sample plots were taken from one farmer. Locating of sample plot in a scientifically accepted method is critical to reduce sampling error. Thus, following steps was followed for locating the sample plots (Figure 2).

1. Once the crop was ready for harvest, a representative plot was identified. The enumerator stood at the south-west corner of the field (Maturity indices: 80 % of panicle turn straw colour, Grains become hard and turns yellow).
2. Four steps were taken along the edge of the field, followed by another four steps into the field.
3. The wooden peg closest to the plant was fixed and marked as Plot 1. The dimensions of the plot area were measured as recommended for the respective crop.
4. To locate the second plot, from the centre of Plot 1, eight steps were taken towards the centre of the field (four steps were used if the field was too small).
5. Another wooden peg was fixed and marked as Plot 2, and the same dimensions as Plot 1 were measured.
6. Similarly, for Plot 3, another eight steps were taken from the centre of Plot 2 towards the corner of the field.
7. A wooden peg was fixed and marked as Plot 3, and the same dimensions as Plot 2 were measured.

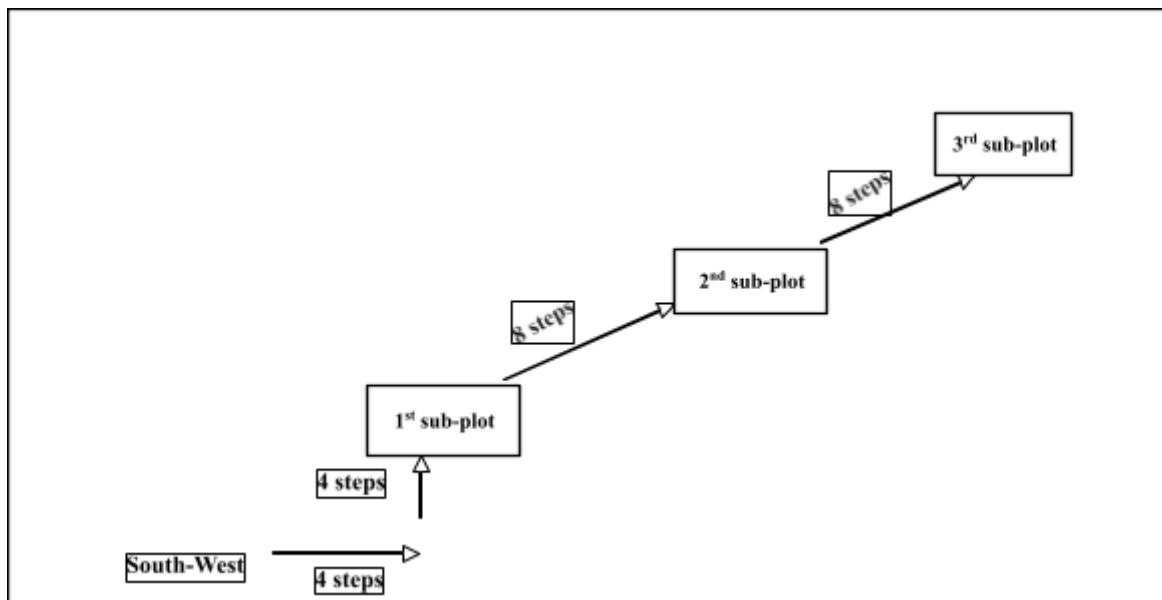


Figure 2. Locating and marking of sample plots

Materials

The materials required for crop cut applies to all the crops as listed below:

1. Measuring tape
2. Weighing balance
3. Moisture meter
4. Rope
1. Wooden pegs
2. Container
3. Sacks
4. Winnower
5. Tarpaulin
1. Pen
2. Data recording sheet
3. Altimeter

Crop cut method

1. Once the sample plots had been located and marked, with the help of wooden pegs and measuring tape, measure an area of 6 m² (3 m x 2 m) as shown in Figure 3.
1. Demarcate the area with wooden pegs and tie a rope to each end of the peg.
1. Harvest the crop that falls inside the demarcated area.
2. Thresh and clean the grains by removing husks, chaff, damaged and unfilled grains.
2. Record the weight of the grain with a weighing balance.
1. Record the moisture content using a moisture meter.
1. Record the yield in the crop cut data recording format.
2. Use this data to compute the yield in kg/ac

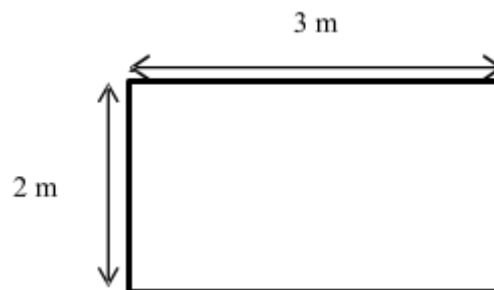


Figure 3: Sample plot area

Yield estimation calculation

Adjusted Moisture content ($_{MC(adj)}$) = (100-actual moisture)/ (100 – desired moisture content (14%))

Yield per acre= average yield from all plots (kg) x 4047 m² x _{MC (adj)}

Result

Dzongkhag	Gewog	Yield (kg/ac)		
		Local	Improved	Average
Dagana	Dorona	867.96	684.43	776.195
Dagana	Drukjeygang	968.86	780.52	874.69
Dagana	Gesarling	1,154.13	887.05	1,020.59
Dagana	Gozhi	1,343.82	na	1,343.82
Dagana	Karna	1,137.57	1,676.21	1,406.89
Dagana	Khebisa	1,180.28	na	1,180.28
Dagana	Lajab	768.63	na	768.63
Dagana	Tashiding	1,352.17	na	1,352.17
Dagan	Tsangkha	950.40	1,427.23	1,188.82
Dagana	Tsendagang	1,088.87	na	1,088.87
Dagana	Tseza	1,300.08	na	1,300.18
Dagana	Nichula	1,165.70	1,308.69	1,237.20
Dagana	Karmaling	nill	nil	nil
Dagana	Lhamoizingkha	nill	nil	nil
<i>Dzongkhag Average</i>				1,128.19
Gasa	Khatoed	0	794.65	794.65
Gasa	Khamaed	1,756.23	832.52	1,294.38
<i>Dzongkhag Average</i>				1,044.52
Punakha	Barp	1,966.4	2,943.81	2,455.12
Punakha	Chubu	2,047.31	na	2,047.31
Punakha	Dzomi	3,255.25	2,804.49	3,029.87

Punakha	Guma	2,750.83	na	2,750.83
Punakha	Goenshari	1,957.38	1,724.55	1,840.97
Punakha	Kabesa	1,958.01	na	1,958.01
Punakha	Shengana	2,412.28	na	2,412.28
Punakha	Talo	2,419.56	na	2,419.56
Punakha	Tobesa	2,161.19	1,514.58	1,837.89
Punakha	Toewang	1,921.93	3,312.76	2,617.35
<i>Dzongkhag Average</i>				2,336.92
Tsirang	Barshong	1,096.32	1,457.88	1,277.1
Tsirang	Doonglagang	1,053.99	na	1,053.99
Tsirang	Gosarling	1,252.78	na	1,252.78
Tsirang	Kikhorthang	1,165.87	1,475.94	1,320.91
Tsirang	Mendrelgang	1,255.29	1,429.32	1,342.31
Tsirang	Patshaling	1,222.29	na	1,222.29
Tsirang	Puengtenchu	1,229.31	na	1,229.31
Tsirang	Rangthangling	857.69	1,521.49	1,189.59
Tsirang	Semjong	842.14	na	842.14
Tsirang	Sergithang	1,164.51	566.66	865.59
Tsirang	Tsholingkhar	1,106.97	1,560.70	1,333.84
Tsirang	Tsirangtoe	1,232.80	1,160.74	1,196.77
<i>Dzongkhag Average</i>				1,177.22
Wangdue	Adthang	1,494.64	2,876.73	2,185.68
	Bjena	2,930.66	na	2,930.66
	Daga	1,326.53	na	1,326.53
	Dangchu	1,549.51	na	1,549.51

	Gasetsho Wom	1,356.0	na	1,356.0
	Phangyuel	1,892.30	na	1,892.30
	Rubesa	2,050.74	3,178.77	2,614.76
	Thedtsho	1,879.12	2,785.57	2,332.35
<i>Dzongkhag Average</i>				2,023.47