

# Impact Assessment on Frontline Demonstration of Potato Variety Kufri Kanchan in Kiphire district of Nagaland

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## ABSTRACT

Krishi Vigyan Kendra Kiphire, ICAR for NEH Region, Nagaland Centre, conducted a study on impact of Frontline Demonstration of potato variety Kufri Kanchan which was demonstrated during two consecutive years, 2021-22 and 2022-23, where 15 farmers were involved for demonstrating the technology in an area of 3 hectares covering five villages. The crop was sown in the first fortnight of February and harvested in the month of June during both the years. The average data on yield was recorded for both demonstrated and farmers practice for analyzing the different parameters. During both the years the highest average yield was recorded from potato variety Kufri Kanchan *i.e.* 235.00q/ha and 239.45 q/ha as against the farmers' practice *i.e.* 131.70q/ha and 133.26q/ha and the percentage increase was recorded at 78.97% and 79.69% as compared to farmers' practice. The average net return from the demonstration during 2021-22 and 2022-23 was Rs.128000 and Rs.131520 as against Rs. 45360 and Rs.46560 under farmers' practice, which recorded a B:C ratio of 3.13 and 3.20 in case of demonstration and 1.75 and 1.78 in case of farmers' practice during both the years. The gap analysis reveals a wide extension gap, technology gap and technology index which indicates the need to motivate and educate the farmers through various means for adoption of the new variety and improved packages of practices so as to realize higher production and economic return. The extension agencies need to put more effort in creating awareness about the new technology along with strong input support in order to ensure higher adoption by the farming community.

**Keywords:** Front line demonstration, Technology gap, Extension gap, Technology index

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## INTRODUCTION

The potato is the world's fourth most important food crop after maize, wheat and rice. It is a good source of dietary fibre, minerals and vitamin particularly ascorbic. Besides being nutritionally superior and highly productive than most food crops, it has a relatively short duration and therefore amenable for inclusion in intensive cropping system. Due to its exceptionally high productivity coupled with high food value, potato demands greater attention to accomplish both food and nutritional security (Wahengbam and Singh, 2013).

The area and production of potato in the district is very less which stands at 379 ha and 124 MT which is very less and was not fulfilling the requirement of the district (Nagaland Statistical Handbook, 2022). This area under potato cultivation mostly consists of the local variety which produces low yield. It is anticipated that, with the availability and adoption of improved technologies, it is possible to bridge the yield gap and increase the productivity of potato in the district. The reasons for low productivity are attributed to poor knowledge about availability of improved varieties, method of crop production, protection technologies and their management

practices by the farmers. KVK, Kiphire conducted largescale demonstration on improved potato by adopting the variety Kufri Kanchan for two consecutive years of 2021-22 and 2022-23, with the objectives of showing the production potential of the new variety through adoption of improved production technologies under hill farming situation. Keeping the above points in view, the present study was undertaken to find out the potential of the technology on bridging the yield gap in terms of technology gap, extension gap and technology index (Singh *et al.*, 2020).

## MATERIALS AND METHODS

Kiphire district lies in the eastern part of Nagaland and is the ninth district of Nagaland which was carved out of Tuensang on January 24, 2004. Kiphire district is surrounded by Myanmar in the east, Tuensang in the north, Phek in the south and Zunheboto district in the west. The district had a total area of 1526.36 sq. km with an altitude of 896.42 MSL. The climate is humid and hot during summer and cold during winter with winter temperature touching a low of 2.7°C and a high of 37°C

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during summer. Monsoon period extends from June to September and sometimes up to October where sufficient amount of rainfall was received over the years. It has 104 recognized villages and a total household of 11015 with a population of 74,033 (2011 census).

The impact study was conducted in Kiphire, Nagaland where Frontline Demonstration (FLDs) on potato variety Kufri Kanchan was taken up for cultivation at farmers field during the consecutive seasons of the year 2021-22 and 2022-23. A total of 15 farmers were involved for demonstrating the technology covering an area of 3 ha during the year 2021-22 and 2022-23. The crop was sown in the first fortnight of February and harvested in the month of June during both the years. A total area of 3 ha was taken up for cultivation, where demonstration was conducted in five different villages. The demonstration in farmers' field was regularly monitored from sowing till harvest by the KVK scientist, where growth and yield parameters were recorded for arriving at conclusion. The average yield and economics of demonstration and farmers' practice was also recorded and analyzed.

To estimate the extension gap, technology gap and technology Index, the following formulae as suggested by [Samui et al. \(2000\)](#) and [Sagar and Chandra \(2004\)](#) were considered. The analytical tool used for assessing the performance of the FLDs are as follows.

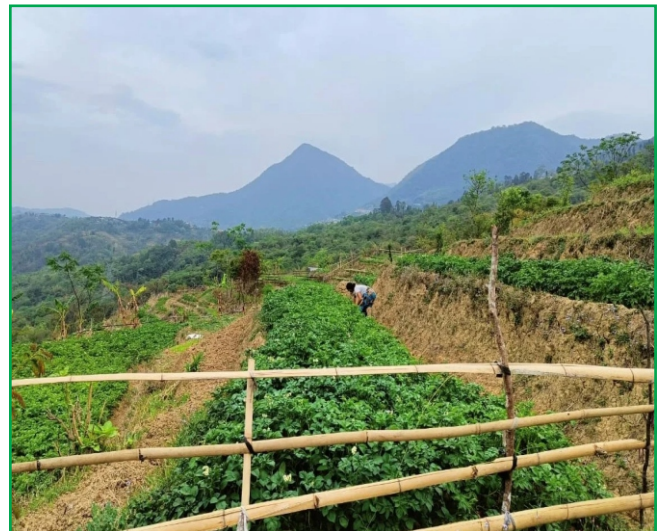
$$\begin{aligned} \text{Extension Gap} &= \text{Demonstration Yield} - \text{Farmers' Practice} \\ \text{Technology Gap} &= \frac{\text{Demonstration Yield} - \text{Farmers' Practice}}{\text{Potential Yield} - \text{Demonstration Yield}} \\ \text{Technology Index} &= \frac{\text{Demonstration Yield}}{\text{Potential Yield}} \times 100 \end{aligned}$$

$$\text{B. CRatio} = \frac{\text{Gross return}}{\text{Gross cost}}$$

**RESULTS AND DISCUSSION**

**Yield analysis of Frontline demonstration of Potato variety in Farmers field:**

Data pertaining to table 1 reveals that the highest average yield was recorded with variety Kufri Kanchan (235 q/ha and 239.45 q/ha) by following improved packages of practices as against the farmers' practice (131.70 q/ha and 133.26 q/ha)



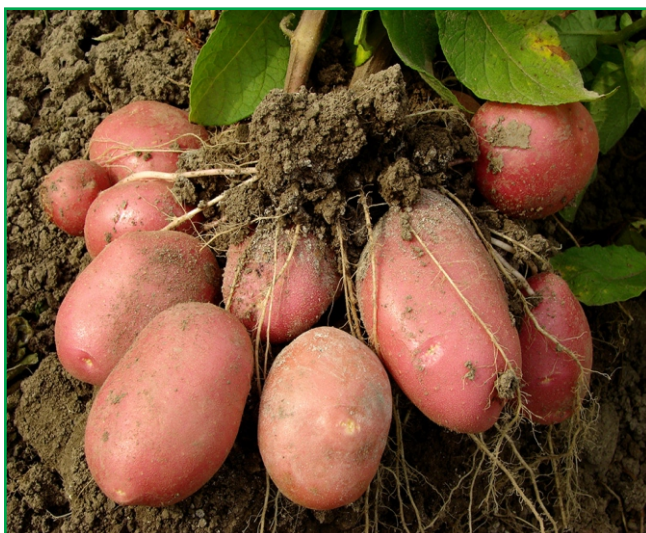
during the year 2021-22 and 2022-23, which recorded an increase in yield percentage of 78.97 and 79.69 percent respectively over the farmers' practice. This conforms with the study conducted by [Dibyendu et al. \(2023\)](#) which recorded the highest yield from Kufri Kanchan as compared to other varieties. The reduced productivity in farmers practice might be mainly due to factors like use of non-descript local variety and low level of agronomic management in addition to non-availability of resources in time. The result depicts the positive effects of FLDs over the existing practices towards enhancing the yield of potato in the district.

**Gap analysis of Frontline demonstration of Potato variety in Farmers field:**

It was observed that there is a wide extension gap which stand at 104.00 q/ha and 106.19 q/ha during the year 2021-22 and 2022-23 respectively (Table 2). It emphasizes the need to educate the farmer through various means for adoption of improved agricultural production to reverse the trend of wide extension gap.

It was also observed that there is a wide technology gap during both the years. A lower technology gap during 2022-23 was recorded at 60.55 q/ha as compared to 2021-22, which was recorded at 65.00 q/ha. These differences in technology gap during different years may be attributed to differential climatic conditions. The average technology gap was recorded at 62.77 q/ha during the period of study. The variation in the technology gap observed might be due to dissimilarity in soil fertility and management factors.

The technology index indicates the feasibility of the evolved technology at farmer's field. Higher technology index reflects the inadequacy of the technology or insufficient extension service to transfer the technology. The technology index during 2022-23 was lower (2019) than during 2021-22 (22.00). A similar finding was reported by [Dutta \(2014\)](#) in rapeseed and mustard and findings of [Mitra and Samajdar \(2010\)](#). They opined that lower the value of technology index; more is the feasibility of the technology demonstrated. The gap analysis reveals the need for more effort to be initiated through different means by different agencies so as to educate and encourage the farmers about the new technologies so as to



reduce these gaps.

### Economic Analysis of Frontline demonstration of Potato variety in Farmers field

Perusal to data depicted in table 3 reveals the economic performance of the new potato variety Kufri Kanchan as compared to local which recorded higher yield as compared to local recording a benefit cost ratio *i.e.* 3.13 and 3.20 as against 1.75 and 1.78 in the farmers' practice. This may be due to higher yield potential of the new variety of potato besides following recommended practices which resulted in obtaining higher productivity. The economic analysis reveals that the technology demonstrated recorded higher gross return and net return as compared to the farmers' practice.

### CONCLUSIONS

The FLD conducted to study the impact of the potato variety and improved package of practice reveals that the farmers' obtained high net return from the adoption of the new potato variety Kufri Kanchan. It may be concluded that adoption of improved production technology can reduce the technology gap to a considerable extent, thus leading to increased productivity of potato in the district. However, there is a need for the Krishi Vigyan Kendra to provide strong technical support through various extension means so as to reduce the extension gap and ensure higher production of potato in the district. The extension agencies need to further motivate the farmers for adoption of the new technologies so as to ensure reduction in wide extension gap and increase family income.

**Table 1:** Yield analysis of Frontline Demonstration of Potato var. Kufri Kanchan in farmers field

Year	No of Demonstration	Technology Demonstrated	Demonstration yield q/Ha	Farmers Practice q/ha	Percent increase
2021-22	5	Kufri Kanchan	235.00	131.70	78.97%
2022-23	5	Kufri Kanchan	239.45	133.26	79.69%

**Table 2:** Gap analysis of Frontline Demonstration of Potato var. Kufri Kanchan on farmers field

Year	Technology Demonstrated	Potential yield q/ha	Demonstration Yield q/ha	Farmer's Practice q/ha	Extension Gap q/ha	Technology Gap q/ha	Technology Index (%)
2021 -22	5	300.00	235.00	131.70	104.00	65.00	22.00
2022 -23	5	300.00	239.45	133.26	106.19	60.55	20.19

**Table 3:** Economic Analysis

Year	Practice	Gross cost Rs/ha	Gross return Rs/ha	Net return Rs/ha	B.C Ratio
2021-22	Demonstration	60000.00	188000.00	128000.00	3.13
2021-22	Farmers' practice	60000.00	105360.00	45360.00	1.75
2022-23	Demonstration	60000.00	191520.00	131520.00	3.20
2022-23	Farmers' practice	60000.00	106560.00	46560.00	1.78

### CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest among

the authors.

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