Agricultural Statistics in Practice
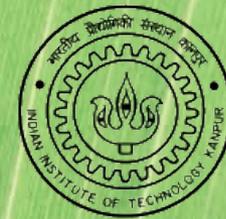
Index Numbers & Forecasting

Measurement or Isolation of Trend

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Measuring Trends

- Identifying trends in a time series is helpful for decision-making.
- Forecasting future trends can inform business decisions about production levels, inventory management, and marketing.
- Trends can help identify growth opportunities and potential risks.
- Trends provide valuable insights for strategic decision-making.
- Understanding trends is important for making informed business and individual decisions.

Methods of Measuring Trends

1. Freehand or graphic trend

2. Method of semi-averages

3. Method of moving averages

Freehand or Graphic Method

- This method is a simple and flexible way to estimate a trend. Steps:

(a) Plot the time series data on a graph.

(b) Join the plotted points with a freehand smooth curve.

(c) Examine the direction of the trend based on the plotted points.

(d) Draw a straight line that passes through the maximum number of plotted points.

Year	2015	2016	2017	2018	2019	2020	2021
Sales	30	46	25	59	40	60	38

Sales Per year

Method of Semi-Averages

- Trend values are found by calculating semi-averages. Steps:

(i) Divide data in 2 equal parts, in odd cases omit middle yr.

(ii) Calculate avg. of each part to obtain 2 points.

(iii) Plot each point at midpoint (year) of each half.

(iv) Join them by a straight line.

(v) Extend it on either side.

(vi) This line represents calculated trend line

Year	2015	2016	2017	2018	2019	2020	2021
Prdn	105	115	120	100	110	125	135

Year	Prdn	Average
2015	105	$\dfrac{105 + 115 + 120}{3}$
2016	115	$= 113.33$
2017	120	
2018		100 (Left out)
2019	110	$\dfrac{110 + 125 + 135}{3}$
2020	125	$= 123.333$
2021	135	

Method of Semi-Averages

- *Future values can be predicted but the trend values obtained by this method and the predicted values are not precise.*

Year	2015	2016	2017	2018	2019	2020	2021
Prdn	105	115	120	100	110	125	135

Prdn. Per Yr.
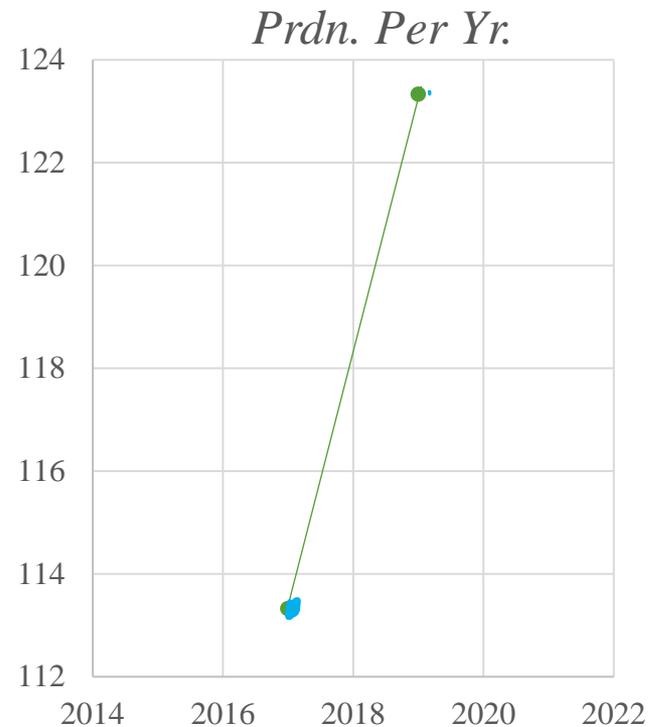
Method of Moving Averages

- The Moving Averages Method provides a trend with a reasonable degree of accuracy by calculating the arithmetic mean of values over a certain time span. Steps:

(i) Determine period of moving averages, such as three years or four years.

(ii) In case of odd years, calculate averages as follows:

$$\frac{a+b+c}{3}, \frac{b+c+d}{3}, \frac{c+d+e}{3}, \ldots\ldots$$

(iii) If moving average is odd, center it by placing average value next to second year of every three years.

Method of Moving Averages

(iv) In case of even years, calculate averages as follows:

$$\frac{a + b + c + d}{4}, \frac{b + c + d + e}{4},$$

$$\frac{c+d+e+f}{4},\ldots\ldots\ldots$$

Year	2015	2016	2017	2018	2019	2020	2021
Prdn	332	317	357	392	402	410	427

(v) If moving average is even, center it by placing average of first four values between 2nd and 3rd year, & average of second four values between 3rd & 4th year. Average these two values & place result in 3rd year. Continue this process for remaining values. This process is known as centering of averages.

Method of Moving Averages

Year	2015	2016	2017	2018	2019	2020	2021
Prdn	332	317	357	392	402	410	427

Year	Prdn	3-yr moving total	3-yr moving avgs.
2015	332	---	---
2016	317	1006	335.33
2017	357	1066	355.33
2018	392	1151	383.67
2019	402	1199	399.67
2020	410	1217	405.67
2021	427	---	---

Thank You