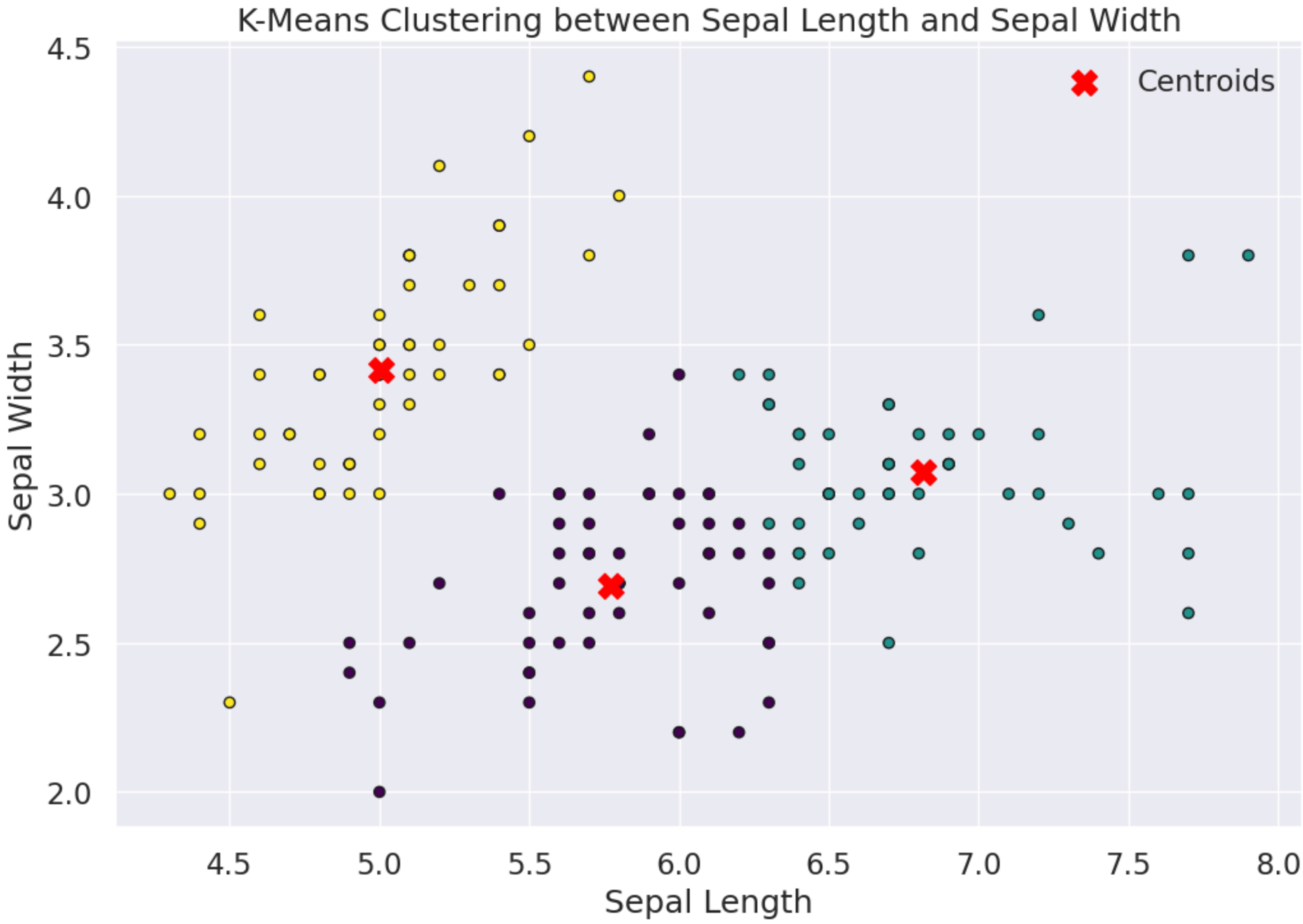
In [31]:

```
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans

df=pd.read_csv("IRIS_DATASET.csv")

X = df[['sepal_length', 'sepal_width']]

kmeans = KMeans(n_clusters=3, random_state=0)
kmeans.fit(X)

centroids = kmeans.cluster_centers_

plt.figure(figsize=(12, 8))
plt.scatter(X['sepal_length'], X['sepal_width'], c=kmeans.labels_, cmap='viridis', marke
plt.scatter(centroids[:, 0], centroids[:, 1], c='red', marker='X', s=200, label='Centroi

plt.xlabel('Sepal Length')
plt.ylabel('Sepal Width')
plt.title('K-Means Clustering between Sepal Length and Sepal Width')
plt.legend()
plt.show()

wcss = []
for i in range(1, 11):
    kmeans = KMeans(n_clusters=i, random_state=0)
    kmeans.fit(X)
    wcss.append(kmeans.inertia_)


plt.figure(figsize=(8, 6))
plt.plot(range(1, 11), wcss, marker='o')
optimal_clusters = 3
plt.axvline(x=optimal_clusters, color='red', linestyle='--')
```

```
/usr/local/lib/python3.8/dist-packages/sklearn/cluster/_kmeans.py:1416: FutureWarning: T
he default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_i
nit` explicitly to suppress the warning
  super()._check_params_vs_input(X, default_n_init=10)
```

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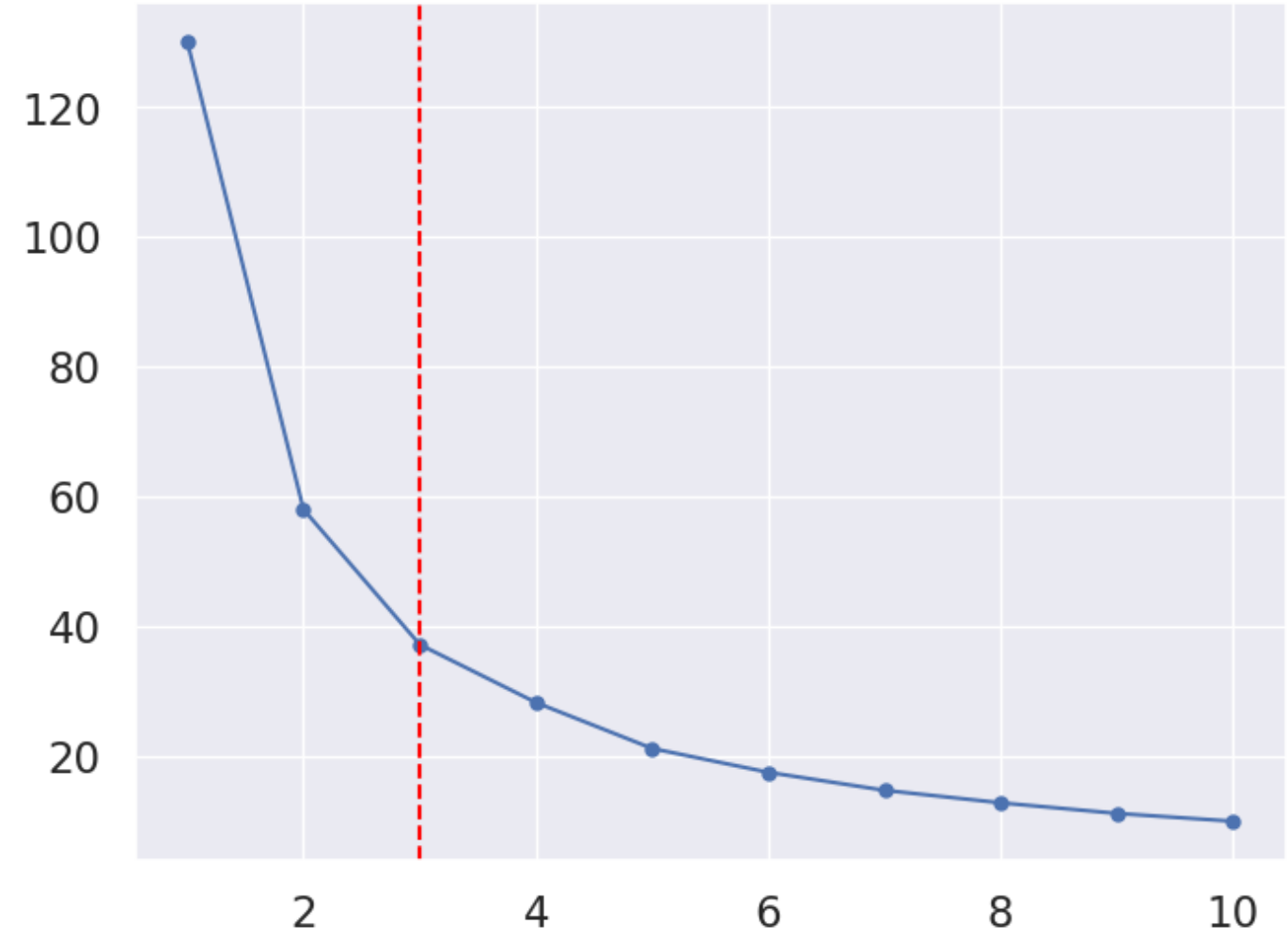
Out[31]:

```
<matplotlib.lines.Line2D at 0x7fb63eb5cf40>
```



In [ ]: