

- **Control weed:** It reduces the likelihood that specific weed species will become adapted to the system and become problematic. For example, *rotation of crops is the most effective means yet devised for keeping land free of weeds.*
- **Use resources more effectively:** Multiple activities, if scientifically planned, lead to better usage of resources. For example, fodder crops can be used for livestock feed, animal dung can be used as organic manure and dairy products helps to enhance farmer's income.
- **Reduce risk for crop failure:** Different crops have different response to the climate vagaries and varied degree of susceptibility to disease attack. Due to such heterogeneity, the risk of total crop failure is reduced.
- **Improved food and financial security:** By reducing the risk of crop failure & diversifying the income opportunities for the farmers, scientifically designed cropping system improves food and financial security.

1.3. Factors Affecting the Cropping Pattern

The cropping pattern and crop diversification in a particular geographical area depends on different categories of factors. All the factors vary in their impact on the crops under different circumstances and times. These factors have been differently classified by different researchers/ institutions. For example, World Bank (1990) has put forward a detailed list of factors under the broad categories of agronomic, economic and policy factors in this regard as determinants of cropping system strategies as mentioned in the table below.

Crop diversification refers to the addition of new crops or cropping systems to agricultural production on a particular farm taking into account the different returns from value-added crops with complementary marketing opportunities

All these factors are interrelated and their relative importance changes over time.

Agronomic, Economic and Policy Factors

Agronomic/Technical	Economic	Government Policy
<ul style="list-style-type: none"> • Climate and soil type (irrigation, topography, fertility, drainage etc.) • Availability of required inputs (fertilizer, chemical, credit, tractors etc.) • Plant/seed of high genetic quality. • Management techniques and quality managers. • Abundance of labour. 	<ul style="list-style-type: none"> • Flow of market signals and communication and information systems, for example, regarding prices in the market, supply –demand etc. • Venture capital and entrepreneurship. • Transparency of input and output prices. • Information on export standards, market demand and relative profitability. • Efficient marketing systems. 	<ul style="list-style-type: none"> • Non-distortionary policy to avoid discrimination among crops. (eg. MSP Policy) • Efficient research and extension programmes, without any bias for major crops or against high value crops. • Contract-farming opportunities • Rural credit. • Off-farm employment opportunities. • Marketing systems including quality standards. • Involvement of the private sector.

(Source: World Bank (1990))

1.4. Types of Cropping Systems

1.4.1. Mono-Cropping

Mono-cropping or monoculture refers to growing of only one crop on a piece of land year after year.

- It may be due to **climatic and socio-economic conditions** or due to **specialisation of a farmer** in growing a particular crop. For example, groundnut or cotton or sorghum are grown year after year due to limitation of rainfall, while in canal irrigated areas, under a waterlogged condition, rice crop is grown as it is not possible to grow any other crop.

Crop rotation: Crops are changed in the field from year to year according to a planned sequence rather than the same crop being grown in the same field again and again.