



## ECONOMICS OF POTATO CULTIVATION IN VILLAGE SHERPUR OF DISTRICT SHIMLA OF HIMACHAL PRADESH

**Mohinder Singh Kadayan**

Associate Professor

Department of Geography

Dr. Bhim Rao Ambedkar College, University of Delhi, India

**Abstract:** The present study is an attempt to highlight the economics of potato cultivation in village Sherpur of district Shimla of Himachal Pradesh. The study is primarily based on primary data but for physical, and socio-economic aspects of the village, secondary data are also utilized. The primary data regarding various agricultural operations or activities like land preparation, sowing, irrigation, manure application (farm yard manure), weeding, pesticide spray, harvesting, transportation, and marketing of the produce under potato cultivation as well as the cost involved in each activity is collected from the farmers of this village through field survey conducted in 2019 under which structured interview method was adopted. A comparative study regarding the cost-benefit analysis for potato cultivation per acre of land is exercised in the case of self/family members involved in potato cultivation in this village which highlights that the net return is 3.87 times more than the cost of cultivation of potato. The net return can be increased if the farmer adopts natural farming instead of doing conventional farming.

**Keywords:** Potato, conventional farming, manure application, cash crop, cost-benefit analysis

### 1. INTRODUCTION

Agriculture is the most essential economic and productive activity on the land surface for sustaining the livelihood of human beings. It is a systematic process which refers to the art, science and business of crop production and livestock. Crop production includes the cultivation of the soil, seed growing, raising the crops and other plants, application of energy inputs, watering to crops, harvesting and thrashing of crop whereas livestock comprises the rearing of various animals. Agriculture provides the foods, fibre, flowers, fruits, fuel, furniture, clothes, shelter and medicine with a clean environment to meet the basic needs of humans and their civilization. It also builds a strong base for the foundation for secondary economic activities by providing valuable and productive raw materials. Moreover, the satisfactory production level of agriculture brings peace, prosperity, harmony, health, and wealth to the individuals of the region or nation, increasing food security, reducing the malnutrition and poverty (Chandrasekaran et al., 2010).

The performance and development of agriculture in a particular region is determined by agricultural production and productivity. Agricultural production refers to the total quantity of final output while agricultural productivity is defined as the total output in relation to total inputs or resources used. The volume of production can be increased by effective and efficient use of fewer for the same quantity of production. The major inputs or resources for the agricultural production system are land, labour, capital, energy inputs and other valuable resources (Rehman and Rehman, 2008).

Potato is the most important food and cash crop in the world. Potato is a temperate crop grown under sub-tropical conditions in India. Potato cultivation is a dominant crop in Himachal Pradesh, especially in district Shimla. The ideal temperature required for potato cultivation is 24° C while 20° C is ideal for its tuber growth. Potato can be cultivated up to an altitude of 3,000 metres above sea level. Loamy and sandy loamy soils are most suitable for its cultivation. Potato has become one of the most popular edible tuber crop in our country and it is rich in starch, vitamins mainly C and B1, and minerals.

Due to the introduction of new agricultural technology, India has achieved relative self-sufficiency in foodgrains and vegetables, especially in potato cultivation. But the achievements in agriculture cannot be fulfilled unless and until the government policies are not framed in the larger interest of farmers and a balanced approach is not adopted for sustainable agricultural development. A farmer is an economic man and he wants to get maximum return for his agricultural products therefore, the present study deals with the economics of potato cultivation in village Sherpur of district Shimla of Himachal Pradesh as this is an important food crop as well as a cash crop for this region.

## 2. THE STUDY AREA

Shimla is a hilly district of Himachal Pradesh which comprises ten community development blocks namely Basantpur, Chauhara, Chopal, Jubbal Kotkhai, Mashobra, Nankhari, Narkanda, Rampur, Rohru, and Theog as per 2011 census. Village Sherpur falls under Mashobra community development block. As per field survey 2019, village Sherpur comprises an area of 0.06 sq. km. (6.47 hectares), having a population of 26 persons (15 males and 11 females) and the number of households are 06. The density of the village is 433 persons per sq. km., while the sex ratio is 733 females per thousand male. The total literate persons in this village are 37.50 per cent to the total population of the village excluding the 0-6 age group population (1 male and 1 female) under which the male literates are 77.78 per cent, while it is 22.22 per cent in case of female literates. Agriculture is the main occupation of the villagers and the cultivators are 90.90 per cent to the total workers (11 persons) of the village under which the male and female cultivators are 50 per cent each. There is no agricultural labourer in this village. The area under forest, land under non-agricultural uses, and the net sown area is 4.86, 0.20, and 1.41 hectares respectively. The main source of irrigation is stream water in this village. Sherpur is 80 years old small village and the nearest city is Shimla. The village is connected by a *kattcha* path upto Chail from where bus services are available. The climate of the village is sub-tropical in nature. The mean maximum and minimum temperature range between 32.2°C (May) to 0.6°C (January) in this village. The snowfall is received during the months of January and February. Despite the hilly topography of the village, the agro-climatic conditions provide a range of potentialities for growing cash crops like off-season vegetables, tomatoes, potatoes, pulses and temperate fruits apart from cereals, millets and oil-seeds. The main cereal crops grown in this village are wheat, maize and rice.

## 3. OBJECTIVES

The major objectives of the present study are as follows:

- a. To find out the cost of production per unit of area under various agricultural operations or activities under Potato cultivation in village Sherpur of district Shimla.
- b. To find out the Economics of Potato cultivation per unit of area in village Sherpur of district Shimla.

## 4. RESEARCH DESIGN AND METHODOLOGY

The present study is primarily based on primary data but for the geographical background of the area regarding the physical, and socio-economic aspects, secondary data are also utilized. For physical setting, the data is mainly collected from Encyclopedia of Himachal Pradesh. For socio-economic aspects, the data is collected from Statistical Abstract of Himachal Pradesh, District Census Handbook Shimla and other official documents.

The present study deals with the Economics of Potato Cultivation in Village Sherpur of district Shimla of Himachal Pradesh for which the primary data is collected from the farmers of this village through a field survey conducted in 2019 under which structured interview method was adopted to know the information regarding various agricultural operations or activities namely land preparation, sowing, irrigation, manure application (farm yard manure), weeding, pesticide spray, harvesting, transportation, and marketing of the produce under potato cultivation. The questions regarding the input-output cost of Potato cultivation and the geographical conditions required for its growth were also asked. Finally, the data collected for various agricultural operations performed for Potato cultivation is processed per acre of land. The men hours spent per acre of land is calculated in each agricultural operation or activity like land preparation, sowing, irrigation, manure application, weeding, pesticide spray, harvesting, transportation, and marketing of the produce for Potato cultivation. The cost-benefit analysis for Potato cultivation per acre of land is exercised in case of landlord and his family involved in Potato cultivation in village Sherpur of district Shimla. The data regarding socio-economic characteristics are presented in per cent for the study area.

## 5. RESULTS AND DISCUSSION

### 5.1. Various Agricultural Operations under Potato Cultivation

#### 5.1.1. Land Preparation/Ploughing

Field preparation is the first step in the process of Potato cultivation. Ploughing (tilling) is the prime activity under field preparation and through this process, the soil is loosed and the roots easily penetrate deep inside the soil and help them to breathe easily. During tillage, the various micro-nutrients of the soil are mixed properly which help in the growth of a plant. The field is levelled by a leveller for the purpose of sowing. Generally, three ploughings are done for potato cultivation and it is done by bullock pair driven manually. Generally, the bullock pair takes 2 hours to prepare per acre of land and the cost of preparation per acre of land is Rs.00 per ploughing and 2 hours are taken by a man per acre of land in each ploughing. The land is generally ploughed at a depth of 24-25 cm. There is no need to irrigate the field as there is a sufficient amount of moisture present in the environment of this village. Due to the availability of rainfall in this area the moisture content in the soil is rich.

#### 5.1.2. Sowing

Soon after the ploughing of the field, the sowing of potatoes is done manually in the first week of February and it is a *kharif* crop and it is sown when the temperature is moderately cool and is harvested in the last week of June. Furrows are opened at a distance of 50-60 cm before planting and these furrows are prepared by an instrument known as *Kudal*. The cut tubers are planted 15-20 cm apart on the centre of the ridge at a depth of 5-7 cm and covered with soil. The farmer brings the complete potato as seed from Manali. The farmer is sowing approximately 7 quintals of potato per acre of land. The man-hours required to sow potato per acre of land is 80 hours (10 men x 8 hours). The cost of 1 kg of potato seed is Rs.8 thus, the total cost of seed is Rs.5,600 (700 kg x Rs. 8 per kg) and the transportation cost to bring 7 quintals of potato seed from Manali is Rs.1,000.

### 5.1.3. Irrigation

Generally, the farmers are dependent upon rainfall for irrigation for potato cultivation in this area. Streams play an important role in irrigating their fields. The stream (*chasma* or *naala*) water is carried by pipelines and it is stored in cemented tanks along with their fields and further, it is used for irrigation purpose. Mainly sprinkling irrigation is used for potato cultivation in this area and 25-30 waterings are given per acre of land by the farmers for this crop. The cost of irrigation per acre of land is Rs.00. Two days are needed to irrigate per acre of land and generally, it will take 30 hours to complete one watering and one man is required for its operation. Generally when the stems of potato crop shoot up from the soil then irrigation is done.

### 5.1.4. Manure Application (Farm Yard Manure)

Generally, the manure application is done before sowing the potato crop and it is mixed with the soil by hands. The farmers are using Farm Yard Manure (FYM) in their fields. 1500 kg of farm yard manure is required per acre of land for this crop and to mix this FYM with soil 280 hours (35 men x 8 hours) per acre of land is required in this area. The family members are involved in this process and no labour is hired in this village. Therefore, the cost of manure application per acre of land is Rs.00 and the FYM is prepared in the field itself. They are not using Di-ammonium Phosphate (DAP). The alternative to DAP is FYM (cow dung, rotten leaves, etc). They are using 150 kg of potash per acre of land for potato cultivation. One man is required for 8 hours for the application of potash per acre of land in this crop. They are also rearing animals to get sufficient cow dung for their fields.

### 5.1.5. Weeding

The potato crop develops canopy in about 4 weeks after planting and weeds must be controlled by this time to gain a competitive advantage for the crop. Weeds are unwanted plants which can grow in any crop. Weeding is done manually by the family members and to weed per acre of land for this crop 20 men are needed and the hours spent in this activity are 160 (20 men x 8 hours). The cost of weeding per acre of land in this crop is Rs.00.

### 5.1.6. Pesticides Spray

Pesticides spray is done for the better growth of potato crop and to protect it from various pesticides. Alternatively, pre-emergence spraying of weedicides such as Fluchloralin (0.70-1.0 kg/ha) or Pendimethalin (0.50kg/ha) is recommended for controlling annual grass weeds and broadleaf weeds. The price of Fluchloralin is Rs.470 for 700 gm. The amount of its use is 0.40 kg/acre in potato cultivation which cost Rs.268. Pesticide spray is done by one man spending 8 hours (1 man x 8 hours/acre).

### 5.1.7. Harvesting

Potato crop is normally harvested when the soil is not very wet. The main crop is ready to harvest when majority of the leaves turn yellow-brown. The potatoes are dug out from the field manually and kept in a shady area. The harvesting of potato crop is done in the month of June. Harvesting is done manually and 20 men are required for this process thus, making a total of 160 hours/acre (20 men x 8 hours). The complete process is done by the family members therefore, the cost of harvesting is Rs.00.

### 5.1.8. Production

The production of potatoes amounts to an average of 50 quintals/acre of land in this village. The products should be kept in a cool place before sending to the market.

### 5.1.9. Transportation

The final product of 50 quintals/acre of potato is transported by pick-up vehicle (Mahindra) to the vegetable market at Solan or Shimla which are nearby to this village. The transportation cost of the product to the market is Rs.500 and loading and unloading of the product is done by 2 family members.

### 5.1.10. Marketing

The market selling price per quintal of potato is Rs.800 and the farmers sell their product in the vegetable market at Solan or Shimla wherever he gets a better price for their product. Therefore, the farmer will earn Rs.40,000 (50 quintals of potatoes at the rate of Rs.800 per quintal) for his product.

## 5.2. Economics of Potato Cultivation

Cost-benefit analysis in general is the structure which involves a set of required activities, which use available resources to obtain a stream of benefits. The cost-benefit analysis for potato cultivation per acre of land is exercised in the case of self/family involved in potato cultivation in village Sherpur, especially for land preparation, sowing, manure application, weeding, pesticide spray, irrigation, harvesting, transportation and marketing of the produce respectively. The various agricultural activities performed and the cost involved in each activity under potato cultivation in village Sherpur are given below:

Table 5.2.1: Cost-Benefit Analysis of Potato Cultivation in case of Self/Family Cultivation in Village Sherpur of District Shimla, 2019

Item	Rs per acre of land (in case of self/family cultivation)
Land preparation (3 Times)	00
Sowing cost [seed (700 kg x Rs. 8 per kg) + transportation cost]	5,600+1,000 = 6,600
Manure cost/Application	00
Potash cost (Rs. 280/bag (50 kg) x 3 bags)	840
Weeding	00
Pesticide spray	268
Irrigation cost	00
Harvesting cost	00
Transportation cost of the product	500
Total cost of cultivation/production	8,208
Total production (kg/acre)	5,000
Market selling price (Rs.8 per kg of potato)	40,000
Net returns (Market selling price - Total cost of cultivation)	31,792

Source: Field Survey, 2019 conducted by Dr. Mohinder Singh Kadayan

Table 5.2.1 represents that in case of potato cultivation done by landlord and his family in village Sherpur of district Shimla in 2019 the total cost of production of this crop is Rs.8,208. In case of land preparation the cost of cultivation is Rs.00, manually sowing cost is Rs.00, seed cost is Rs.5,600 (700 kg x Rs.8/kg), transportation cost of seed is Rs.1,000, irrigation cost is Rs.00, manure application cost is Rs.00, potash cost is Rs.840, weeding cost is Rs.00, pesticides cost is Rs.268, harvesting cost is Rs.00, and transportation cost is Rs.500 of potato crop in this village. The final product of potato amounting to 5,000 kg per acre of land and per kg of potato is sold at a rate of Rs.8 therefore, the total market selling price is Rs.40,000. Consequently, the net return in the case of landlord and his family involved in growing of potato crop in this village is Rs.31,792, which is 3.87 times more than the cost of cultivation of potato. The net return in case of potato production can be increased if the farmers of this village use organic manure/farm-yard manure in place of potash and if the paste of poisonous leaves or bitter leaves present in their area are used in place of pesticides.

## 6. CONCLUSION

The study highlights that the cost of potato cultivation as a tuber crop is Rs.8,208 per acre of land in case of cultivation done by the landlord (self) or his family in village Sherpur of district Shimla of Himachal Pradesh. The cost of sowing is recorded maximum followed by manure application, transportation, and pesticide spray. The total production is recorded 5,000 kg/acre of land and the market selling price is Rs.40,000. Thus, the net benefit is Rs.31,792 per acre of land of the landlord or his family involved in potato cultivation, which is 3.87 times more than the cost of cultivation. The net return can be increased if the farmer adopts natural farming instead of doing conventional farming as the area is favourable for potato cultivation.

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