Chapter-I

INTRODUCTION

The sub-mountainous zone of the Punjab State locally called the ‘Kandi’ area is situated below the Himalayan range of Shivalik hills. It stretches for about 250 km length in Punjab State along its north-eastern border with the states of Haryana and Himachal Pradesh. The Kandi belt in Punjab State varies from about 10-25 km in width. This belt thus, mainly comprises the sub-mountainous and undulating terrain as a narrow stretch of land to the north of Ambala-Chandigarh-Roopnagar-Hoshiarpur-Dasuya-Pathankot road in the districts of Sahibzada Ajit Singh Nagar, Roopnagar, Shahid Bhagat Singh Nagar, Hoshiarpur and Gurdaspur. It covers an area of about 4600 sq. kilometers and constitutes nine per cent of the total geographical area of the State. Nearly, six per cent of the State’s population inhabits in this area.

The geographical features characterize this zone as sub-tropical area with the summer as well as winter being severe. The soils are hard clays, sand and conglomerates and shaped through erosion of the upper regions of the Himalayas. General elevation of the tract varies from about 300 metre in the southern plains to about 600 metres above MSL in the Shivalik hills towards the north. These areas have highly cut up steep slopes in upper catchments, which in combination with inherent fragile geology and typically high intensity rain storms, results in rapid soil erosion. The average annual rainfall is about 1000 mm. About 80 per cent of the rainfall occurs during the monsoon months with a high coefficient of variation. The drainage density in this tract is very high, with 7 to 9 km of drainage channels/gullies per square km leading to problems of soil erosion, flooding and declining productivity. After heavy rains, especially during monsoon season, the seasonal hilly torrents bring large amount of sand and gravel in flashy floods down the hill slopes to the foot hill planes below. These ever meandering hilly streams, locally knows as “Choes”, render vast areas of fertile farm land into sandy wastes, and are a constant cause of economic losses. There is a network of 21 major and 120 minor choes (watersheds) originating from the highly erodible catchments in this region.

Most of the land as a consequence of the incessant in coming of sediments and uncontrolled gush of water year after year remained unfit for farm operations. The process of conversion of plains of this Zone into uneven sandy lands has continued over a long period of
time. The soils had low biological activity due to deficient organic carbon content. Also, the water scarcity was the characteristic feature of this sub-mountainous tract. As a result, the productivity of agricultural land as well as that of the livestock has been adversely affected and development of this area remained thwarted.

The inhabitants of this tract mainly depended on land and the allied activities. They possess small land and other resource endowments as well as had poor market access. Consequently, they could obtain low incomes and thus maintained a poor living.

**Development Project Activities**

In view of the above scenario, the State Government realized the need for the development of this area facing the degradation of its natural resources. Hence, the efforts were initiated in terms of watershed development strategies. In the year 1979-80, the Government of Punjab launched an ambitious development project called the ‘Kandi Watershed and Area Development Project’ with funds from the World Bank. This project was a monumental multi-component approach to the problems of sub-mountainous Punjab. These components included the soil conservation, irrigation, forestry, agriculture, animal husbandry, horticulture and fishery. This project ostensibly aimed at reversing the man made ecological degradation and protecting and developing agricultural land that was subject to severe erosion and flooding. The emphasis of the project was on sustainable development of the Zone and replicability of the treatment practices. In order to ensure sustainability, the management of common property resources was also considered. This project was completed in the year 1987-88 and it remained instrumental in improving the land and water resources as well as raising the farm productivity levels and thus the farm incomes. A component-wise review of the above project showed that the development efforts needed an improvement in their focus. It was realized through time that the same could be achieved by bunching the soil-conservation, forestry, agriculture, animal husbandry and horticulture components in one set and isolating the irrigation part for the independent line of action.

In the light of the above review, another World Bank financed project, ‘Integrated Watershed Development Project (IWDP-Hills)’ was made operational in the year 1990-91. Although, the project aimed at reversing the ecological degradation and stabilizing the resource base for sustaining the pattern of development, the approaches for achieving the objectives included the use of appropriate soil and moisture conservation technology. The
process of conserving the soil and in-situ moisture would improve the production and income from grain crops, horticulture, fodder, fibre and livestock also reduce flooding and other devastations in the project areas. With this in view, the land was treated by using contour vegetative barriers, planting shrubs and trees on contour trenches, gully stabilization, stream bank protection, construction of water harvesting structures, etc. The other project activities included the demonstration of rainfed farming technology to promote in-situ moisture conservation on arable lands, introduction of horticulture on marginal arable lands, treatment of upper catchment areas and improvement of livestock through supplementary feeding and artificial insemination.

**Project Impact Evaluation**

Since, the development project of the stature of the above mentioned two projects viz., ‘Kandi Watershed and Area Development Project’ and, ‘Integrated Watershed Development Project’ involved the investment of huge amounts of funds from the public coffers. Therefore, it becomes essential and necessary to undertake investigations on the economic efficiency of the utilization of these funds on one hand. On the other hand, measurement of the magnitude of the impact of the project development activities on the socio-economic parameters associated with the inhabitants remains a vital part of the project evaluation. This could be visualized through the measurement of shifts in these parameters including the changes in product-mixes, crop intensity, crop and livestock input use, productivity levels and the earnings of the project stake holders. The most important aspect was the levels of resource use, use-efficiency and the associated productivity and the income levels.

**Resource Use**

Contemporary to the development of the subject matter of modern economics in the post-Adam Smith and the Marshallian construction of scientific definition of economics, it was Lionel Robbins who provided the widely accepted treatment on this subject. It was expressed that, ‘Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses’. Obviously, Robbins stressed upon the scarcity or the limitation of the means/resources and further highlighted that these resources have the alternative uses. Therefore, according to him, the science of economics is mainly centered around the knowledge of resource use to meet the ends.
Doubtlessly, there is no denial to the fact that the production resources are scarce and call for a judicious use. This remains the crux of the subject of economics. Also, while defining the science of Farm Management, the major emphasis is on the judicious use of scarce farm resources so as to obtain the optimal incomes on the sustainable basis. Although, an efficient farmer allocates his land, labour, water and other resources in an optimal manner, so as to maximize his income, at least-cost, on sustainable basis. However, there are instances showing that the farmers often use their resources sub-optimally. While, some farmers may attain maximum physical productivity per unit of land at a high cost, some others achieve maximum profit per unit of inputs used. In the light of this, the scientific investigations on the use of production resources in farm business are very vital for bringing out their use efficiency.

**Objectives of the Study**

A deep scanning of the existing project impact evaluation studies showed that this evaluation was in the want of a scientific probe on the availability and use of farm resources both in the project and non-project areas of the sub-mountainous tract of the Punjab State. Thus, the present study is an attempt to fill up this gap with the following specific objectives.

1. To analyze the existing pattern of farm resource use and the associated income Levels,
2. To identify the economic gaps in the existing resource-use and the prescription For their optimal use and estimation of the income levels associated with that level of use.