Pak. j. life soc. sci. (2007), 5(1-2): 6-10

Pakistan Journal of Life and Social Sciences

Economics of Chickpea Production in the Thal Desert of Pakistan

Nisar Ali Shah, Khalid Mahmood Aujla, Mazher Abbas[2] and Khalid Mahmood[3]
Social Sciences Division, Pakistan Agricultural Research Council, Islamabad-Pakistan
[2]Technology Transfer Institute (PARC), AARI., Faisalabad-Pakistan
[3]Agriculture Sector, SMEDA, Lahore-Pakistan

Abstract

The production of chickpea in Thal desert of the Punjab is currently subsistence in character. The area experienced low chickpea production during the year 2005-06. A survey was launched to figure out the real factors that contributed towards low chickpea production. The results of the study were anticipated to provide basis for devising strategy to improve and sustain future chickpea production. Chickpeas are used both for human consumption and animal feeds in rural and urban areas. Almost two-third of the farmers have more than 20 hectares of rainfed land. Eighty-five percent growers used their own seed from previous crop. Lack of cleanliness in the marketing of the local landrace is one of the important factors in low productivity and less market prices. The scope for increasing production through adopting drought resistance high yielding varieties and improved management practice seems contribute significantly. The cost-benefit ratio of 1:2.5 suggests that even in the present circumstances chickpea production is beneficial in this desert area. Adopting improved technology in chickpea production would further increase the returns at the farm level.

Key word: Thal desert, Production, Chickpea, Kabuli, Punjab, Cost-benefit ratio

Introduction

Chickpea is the major source of livelihood of the rural people in the Thal desert of Punjab. Its production entirely depends upon the intensity and distribution of rainfall. There are two main types of chickpea, distinguished by seed size, shape and colour. The first relatively small seeds is called desi and with large seed called kabuli. Desi chickpea is cultivated mainly in the Indo-Pakistan subcontinent. Thal accounts for the bulk of production of this crop. In the period 2005-06, Pakistan had a total area of 1028.90 thousand hectares annually under chickpea (4.3 % of the total cultivated area), constituting 6 percent of the total area under pulses in the country. This produced 479.5 thousand tones with an average yield of 466 kg/ha. Overtime productivity of chickpeas decreased from 617 to 466 kg/ha during 1996-2006. On an average, Punjab province contributed about 80 percent of this production and the Sindh, NWFP and Balochistan provinces produced the remaining 20 percent (Govt. of Pak., 2006). Within Punjab, Khushab district contributed 28 percent of gram production while the remaining comes from all other districts of Punjab. In Noorpur Thal desert of Khushab district of Punjab, where no other crop grows so successfully, it plays a vital role in the cropping systems of subsistence farmers (Govt. of Punjab, 2005). It helps in the management of soil fertility, particularly in dry areas of the Thal desert, by deriving a major part of its nitrogen from symbiotic N2 fixation. Chickpea meets 80 percent of its nitrogen requirement from symbiotic nitrogen fixation and can fix up to 140 kg N ha -1 from air. It leaves substantial amount of residual nitrogen behind for subsequent crops and adds much needed organic matter to maintain and improve soil health, long-term fertility and sustainability of the ecosystems (ICRISAT 2005).

The amounting pressure on our economy to feed more people has increased the importance of utilizing the potential rainfed regions of Pakistan to improve food security (Mahmood, et al.1991).

Chickpea is drought tolerant cash crop and thus is the major wealth for the people of Noorpur Thal. All social activities of the farming communities like marriages, sickness of human being, and livestock rearing are mostly concerned with this crop. There was a wide gap potential and actual yield, which may be attributed to various constraints, viz., crop management, labour management, and infrastructural constraints (Pankaj, et al., 2001 and Sharif, 2004).

Chickpea is the most important pulse crops mainly grown in the irrigated and rainfed areas of Punjab by resource-poor farmers in drought prone areas

Corresponding author: Khalid Mahmood Aujla
Social Sciences Division, Pakistan Agricultural Research Council, Islamabad-Pakistan

specifically. Considerable progress has been achieved in developing improved varieties of chickpea that fit specific niches in the cropping pattern. Fallow areas were brought under chickpea
cultivation as the crop could now escape terminal drought. However, large-scale adoption could not be sustained due to several socio-economic and technological constraints. Low productivity growth of chickpea has resulted in declining or stagnant per capita availability of this crop in the major producing regions. An important policy question is whether the decline in per capita availability of pulses is a supply or demand constraint. In the short to medium term, supply would be more constrained than demand for chickpea. Population and income growth and positive income elasticity of demand would ensure present levels of consumption. In the long run demand would be more constrained due to changes in tastes, preferences, and urbanization. Their overall benefits extend much beyond generating income to resource-poor farmers. For the long run sustainability of the system, improvement in production through improved varieties resistant to pests and diseases and better agronomic management should continue in the future. The focus of research should be on developing production technologies appropriate for diverse environments. Chickpea production in Noorpur Thal has declined severely in recent years. The survey describes the existing production practices, identifies technical and socio-economic constraints of low productivity, and determines average cost of chickpea's production and returns at farm level.

Materials and Methods

This section summarizes the methodology for the research study. It briefly describes the selection of the study area; sampling technique, selection of farmers. It also gives source of sample data, method of data collection and analysis. The desert of Noorpur Thal district Khushab areas were selected. A semi-structured questionnaire was prepared to gather information from the gram producers. This questionnaire was pre-tested and necessary changes were incorporated for making smooth interviews possible during the formal survey. The survey team was comprised of agricultural economists and accompanying the local extension agent. The information gathered pertains to rabi 2005-06. In total 40 farmers were interviewed. On the basis of previous informal surveys and data gathering, it was determined that a sample size of 40 farmers would be sufficient and adequate. Villages as well as farmers were selected for questioning at random with the initial provision that they were currently chickpea producers of the Thal desert.

Estimation of Costs and Incomes

Net value of the produced and cost involved were estimated. Cost of variables inputs such as labour, ploughing, planking, seed, fertilizer, irrigation, harvesting and threshing were computed. For the estimation of gross income, the value of product (grain) and by product (dry stock) during the year was taken in to the account. To compute the net income the following formula was used:

i. Net return

NR = GR - TVC

Whereas

NR = Net return
GR = Gross return
TVC = Total variable costs

ii. Cost Benefit Ratio

It is defined as the amount received in the shape of profit on the costs of one rupee. The CBR was computed by the methods adopted by Siddiqui and Ansari, 1983.

CBR = Nr/TVC

Whereas

CBR = Represents costs benefit ratio
Nr = Stands for net returns
TVC = Denotes total variable cost

Results and Discussion

Socioeconomic Profile of Sample Farmers

The socio-economic features of the farming families like personal characteristics of the farmers and socio-economic attributes related to their families and farms are generally considered important in receptivity of innovations and farm productivity. The mean age of the respondent or the farm operator was about 50 years with 70 percent primary level education, and 23 years of farming experience. The average household size was about 12 persons per family. In rural setup, farm size and its composition has a significant bearing on the social and economic position of the farmers. Seventeen percent farmers have less than 10 hectares whereas 65 percent farmers have more than 20 hectares of land. Livestock is an integral part of the rural economies as its products like milk and meat help improving the food and nutritional security of the farming households. In the form of farmyard manure, it helps conserving soil fertility. It also provides regular source of income and buffer against crop failure shocks and fulfilling urgent family financial needs. In some rural societies, bigger livestock herds are positively associated with social status. Farmers generally prefer keeping their wealth in the form of livestock farming. The gram producers interviewed were in general larger than average land owners with 30 hectares. On an average, more than sixty percent of the farmers having two milking buffalo and young

stock, and five milking cows with its young stock while each farmer had 18 sheep/goats. Most of the people living in rural areas raised animals especially buffaloes and cows for milk production for home consumption as well as for income generation from the sale of milk and by-products. However, the total land area under chickpea was more than 25 hectares per respondent with yields averaging between 1150-2000 kg/ha in the last years. More than 60 percent of all farmers were operating a mixed rainfed crop/livestock enterprise which was reliant solely on family labour. Threshing operations in the target areas are usually by threshers. Harvesting is done by hired labours, mostly migrated from neighboring districts of Punjab during this season. Thus increased competition for labour would not be a constraint to greater chickpea production.

Majority of the farmers indicated that their families were growing the crop from very long time and that there has been no change in the acreage since then. Yields are low (1477 kg/ha), which suggests that a potential for an increase exists. The farmers were asked about the main problems they experienced when growing chickpea. Insects are major concern for the farmers due to the major contributors to yield losses. Agriculture constitutes primary source of income and employment for the people of the area. Besides others crops, chickpea is the most important crop grown both for home consumption and marketing. The productivity of chickpea was very low due to the use of traditional varieties and poor quality seeds mainly produced at their farms since many years.

In view of shrinking land and water resources, the only option left to meet future challenges on food, fiber, fuel and other needs is through increase in productivity. The key factor in this process is the development of new technology that will produce higher yields per hectare. Fertilizer will be a key player in this most important task as it has been in the past. But in future, we have to insure that fertilizers are used scientifically in a most efficient and balanced manner. Fertilizer prescription should insure correction of all existing nutrients deficiencies and should be optimum in quantity to meet the crop's nutrient requirement fully so as to achieve the set yield target.

Table 1: Economic Analysis of Chickpea Production during 2005-06 in the Study Area

Items and units	Units	Amounts (Pak Rupee)
Inputs side		
Cost of ploughing	Rs./ha	741.33
Cost of sowing	Rs./ha	679.60
Seed rate	kg/ha	51.00
Cost of seed	Rs./ha	1166.40
Weeding cost	Rs./ha	840.20
Harvesting cost	Rs./ha	988.45
Threshing cost	Rs./ha	1482.67
Land rent @ Rs.5085/ha (for six months)	Rs./ha	2563.77
Managerial cost	Rs./ha	4942.20
Mark up @ 11 %	Rs./ha	1474.51
Total cost of production	Rs./ha	14879.11
Output side		
Grain yield	kg/ha	1477.00
Dry stalk yield	kg/ha	951.38
Returns from grain yield	Rs./ha	33794.05
Returns from dry stalk yield	Rs./ha	2739.96
Returns Analysis		
Gross benefit	Rs./ha	36532.05
Net benefit	Rs./ha	21652.99
Returns per rupee invested		1 : 2.46

Source: Field Survey Results 2006

Economic Analysis of Chickpea

Chickpea is the dominant crop throughout the rainfed area. Accordingly much of the emphasis and its management practices along with its cost at farm levels were investigated in detail. Management plays an imperative role in optimal utilization of the available resources as proper management of different key inputs such as quality of seed, variety, method of sowing, timely sowing etc not only increase the production but also decreases the cost of production and hence productivity and net returns could be increased without additional investment of resources. With in inputs seed is the basis of crop production, which acts as genetic carrier, and use of quality seed of high yielding varieties is, therefore, the key, which unlocks the door to dramatic surge of the productivity when combined with the use of other inputs under favorable environmental conditions. To have a better picture of returns per unit area, net returns per hectare was calculated and the estimates are presented in Table 1. The cost of cultivating per hectare of chickpea in Thal desert was computed to be Rs. 14879 with a net income of Rs. 21653. The benefits costs ratio was 1:2.46. These results implied that chickpea cultivation is very profitable enterprise in the study areas. The results of the study suggested that there are still some technical problems, which must be resolved for increase in chickpea crop production and net returns.

Conclusion and Recommendations

The ultimate objective of this study is to increase the income of the chickpea growers and improve the economic condition of resource poor farmers. It is only possible by increasing per acre yield of major crops particularly the high value cash crops. It is clearly indicated that there are opportunities for growers to enhance income from chickpea cultivation by getting potential yields. The empirical investigation revealed that resources are not optimally allocated that resulted in low yields. Farmers are cultivating their traditional varieties that are susceptible to diseases. The role of extension agents is not encouraging in promoting the cultivation of high yielding varieties. Therefore, there is need to improve the cultural practices, by adopting recommended technologies by the growers. There is obviously a great need of developing high yielding drought- and disease-resistance varieties and educate farmers regarding the improved management practices to obtain potential chickpea productivity in the Thal desert.

Inadequate and inefficient use of farm inputs adversely affected land productivity. Intensive use of agriculture machinery needs to be popularized among farmers with a view to improving the average yield. Plant protection measures help in increasing per hectare yield by protecting crops from damages because without effective protection against the attack of pests and diseases, the beneficial outcome of other inputs may not be realized. Improved seed distribution and access to credit are other elements in low productivity. The availability of certified seed in the Thal is limited. Beside this research in genetic improvements of seeds to shorten the crop-growing period should be undertaken. Credit card scheme should be introduced for resource poor farmers. Besides this, availability of institutional credit should be enhanced taking into account the requirement of agriculture sector (Zuberi (1989) and Malik (1990). The complicated process of getting loans should be simplified and entire loaning system made easier and friendly.

The climatic uncertainty due to erratic rainfall in the Thal desert is the main obstacle of crop production under rainfed conditions. During the drought periods, all the produce is vanished and even farmer had no seed to sow for the next year. Seed production needs some special emphasis to maintain the quality and purity. Farmers give little attention for their home produced seed and have no difference in grain and seed. Farmers did not distinguish between varieties of irrigated and rainfed areas, which is a serious constraint in overcoming the issue of low productivity.

There is serious lack of knowledge on farmers' part about seed management information. If the farmers manage improved seed by their own devised methods, there is a great danger of its viability loss. Farmers should be trained in seed production and storage management techniques so that its viability is maintained. Outdated and poor quality chemical fertilizer, pesticides and seeds should be banned and the supply of quality inputs should be ensured through government departments or authorized dealers. Institutional reforms are needed to update, improve and make users' responsive the agricultural research, extension and education services. Electronic media should extensively be used for telecasting programs and projecting details of various components of the improved agricultural technologies.

References

Government of Pakistan, "Agricultural Statistics of Pakistan (district-wise)". Economic Wing, Ministry of Food, Agriculture and Livestock, Islamabad. 2006.

Government of the Punjab. "Punjab Development Statistics, Government of the Punjab, Lahore, 2005.

ICRISAT. "Chickpea" International Crops Research Institute for the Semi-Arid Tropics webmaster-icrisat@cgiar.org 2005.

Mahmood, K., M. Munir, and S. Rafique. "Rainfed Farming Systems and Socio-economic Aspects in Kalat Division (Highland Balochistan). Pak. J. Agri. Soc. Sci., 5: 15-20, 1991.

Malik, S. J. "Agricultural Credit Markets for Sustained Growth and Development of Agriculture in Pakistan. Agricultural Strategies in the 1990's" Issues and Policies.183-195. 1990.

Pankaj, K., Deshmukh, P.S.; Kushwaha, S.R and Sunita-Kumari. Indian Society of Agricultural Science. Annals of Agricultural Research. Division of Plant Physiology, Indian Agricultural Research Institute, New Delhi, pp. 110-112, India, 2001.

Sharif, M. "Wheat yield Gap Analysis: Future Options for Pakistan: A Report submitted in partial fulfillment of the requirement for intership programme in Agricultural Economics B.Sc. (Hons.) Agriculture, 2004.

Zuberi, H. A. "Production Function, Institutional Credit and Agricultural Development in Pakistan". The Pakistan Development Review, 28:1, pp. 43-56, 1989.