Chapter II

Review of Literature
REVIEW OF LITERATURE

The relevant literature having direct or indirect bearing on the present study are as follows.

Fotidar, (1935) observed that in Kashmir Valley, saffron crop is raised as a rainfed crop and no manure or fertilizers are applied to the soil. Due to continuous depletion of nutritional status of the soils, the crop does not thrive well which is a major factor contributing to low yields.

Gathercoal and Wirth, (1947) reported that cultivation of saffron in Kashmir (India) is very old, saffron is reported to have been important ingredient of prescriptions of Vaghbhatta and Sushrutta who practiced medicine in Kashmir about 500 B.C.

Datta, Raychandhari and Dakshinamurty (1957) found that the presence of calcium which is found in Pampore soil, spread over the surface and scattered in the various horizons of the profile.

Warburg (1957) stated that saffron belongs to the family iridacea. The genus crocus has about 80 species with their main centre in the eastern Mediterranean region.

Jalali (1962) reported that in Kashmir saffron beds of 1.5×2m size or 1.5m wide with any convenient length depending upon the slope and topography of the field are preferred, drains about 15cm deep and 15cm–20cm wide are made all around the raised beds.
Srivastava (1962) observed that saffron thrives best in regions with a warm subtropical climate and requires a well-drained sandy loam or loamy soils that are free from clay and decaying humus. Adequate soil drainage is essential for the development of corms. The saffron remains in bloom for about 15-20 days from mid Oct. to early Nov. in Kashmir.

Srivastava (1964) has recommended 6-8 ploughings starting from March and continued till the time of planting (mid July – mid Aug).

Madan, Kapur and Gupta (1966) reported that saffron cultivation was in vogue around Pampore (Kashmir) even during the region of Lalitaditya. He recommended $10\times10$cm spacing of seed corms plant about $12\times18$cm deep for better growth under Kashmir conditions.

Ashria and Imanishi (1968) reported that corms planted in short day length increases yield of corms but long day sown corms reduced it. A constant temperature of $20^\circ$C after flowering increasing yield and corms.

Srivastava (1968) observed that one gram of saffron from about 115 flowers is obtained and one Kg dried saffron from the styles and stigmas of about 1,15,000 to 1,50,000 flowers. In Kashmir an average yield of $2.5 - 3.0$ Kg/ha is obtained after 3rd year, at the end of 5th year on additional 6-8 lakhs of seed corms are also available.
Ingram (1969) reported that saffron plant grows in climatically diverse regions varying in altitude, range of temperature and humidity conditions.

Mathur (1973) suggested that corms should be planted at a depth of 12-18cm, the deep planting provides sufficient room for the growth of the corms and they are fully protected when top soil was washed away during the rainy season.

Jaiswal and Ayra (1974) pointed out that financial position of farmers and size of holding were major factors influencing adoption of improved practices.

Khan (1977) observed that in saffron irradiation populations at high dose decreased plant height along other vegetative characters.

Kulkarni (1979) noted that uneconomic holdings, use of traditional methods and implements, poor irrigation facilities, poor fertilizer application has resulted in technological differences.

Ray (1980) observed that lack of information, lack of adequate technical guidance and shortage of skilled labour were considered to be vital constraints in the adoption of improved summer paddy technology.

Sangle and Kulkarni (1980) indicated that degree of commercialization family education and knowledge about technology significantly contributed to low technological gap.
Bhoite and Nikalje (1983) found a positive significant association between socio-economic status and adoption of recommended agricultural practices.

Khadka (1983) reported that adoption behaviour was not influenced by socio-economic status, knowledge of credit and input agencies, contact with extension agents and credit use, jointly explaining 70% of the variation in adoption behaviour.

Kubde and Sinha, (1983) observed that land possessed by the farmers, irrigated land available with them and their income levels were significantly related to technological gap.

Laneri, Lucretti and Tommaro (1983) observed only morphological variants at first flowering in the corms treated with 13 Gy. Gamma dose.

Kulkarni and Sangle (1984) reported that non compatibility of recommended technology, insufficient supplies of inputs and credit, non-availability of services and supplies and lack of knowledge about technology were found to be important constraints responsible for increasing the technological gap.

Patil (1984) concluded that major constraints in the adoption of rabi paddy technology were lack of knowledge, lack of adequate guidance, non-availability and high cost.
Mishra and Sinha (1985) found that caste not played a significant role in adoption of recommended agricultural practices.

Halevy (1986) reported that the formation of contractile absorbing roots of saffron is not induced only by the depth factors, but also by the presence of the contractile roots.

Bhatol (1987) concluded that among different constraints low price of produce, high cost of seeds, high wages of labour, now availability of pure seeds and unavailability of labour were the major constraints faced by paddy cultivators.

Bhoite and Thorat (1987) found that water management, nutrient management and pest control were together responsible for 50.6% of the yield gap. Ecological factors such as temp. soil and rainfall were together responsible for 19.8% of the yield gap.

Bhoite, Shinde and Rokade (1987) reported that the level of adoption of recommendations on breeding, feeding, management practices and animal health related to milk production was 57.4, 49.4, 60.7 and 55.75 per cent respectively. Also found highly significant associations between use of infrastructural facilities, social participation, use of community resources, milk production, attitudes and knowledge of farmers.

Chitnis and Bhilegaonkar (1987) reported that the major constraints causing a technological gap in the process of adoption of
dryland technology are technological, credit and economic, service and supply and information transfer.

Kothikbane, Bhilegaonkar and Deshmukh (1987) found that all the categories of farmers perceived the technical, economic, service and supply constraints in a similar way, but differed in the way they perceived the information transfer constraints.

Ballabh and Prasad (1988) found average technological gap 44 per cent. It was found maximum 65 per cent in plant protection measures. It was minimum in the use of high yielding varieties seeds (31%) followed by chemical fertilizers (37.75%) while it was 42.75% in improved farm implements and proper irrigation.

Singh, Singh and Saraswat (1988) reported that the main constraints responsible for technological gap on small farms were: termites, poor economic gain, poor knowledge, lack of secured irrigation, non availability of managerial sources, poor organization and marketing system, poor farm potential and non-availability of labour.

Tyagi and Tyagi (1988) concluded that education and credit orientation were the most important determinants of technological gap in case of small farmers. However credit orientation was found to be most important factor of technological gap with regard to medium farmers and in case of big farmers education was found to be the most important factor.
Chaudhary and Dasgupta (1989) concluded that small holdings, financial limitations and lack of timely assured irrigations, high cost of inputs were the most important factors for non adoption of improved agricultural technology.

Chichiricco (1989) reported that a small number of fertilized saffron ovules were able to develop to mature seeds.

Anonymous (1990) R and D projects are reported on the post harvest technology of regional agro-horticultural produce i.e. saffron.

Bhoite and Dusane (1990) observed that non-availability of seed, lack of knowledge about seed treatment, adulteration in seed, high cost of seed were major constraints in the adoption of sunflower technology.

Chichiricco (1990) reported that hormonal treatment is a breeding method that would cause elongation of the true flower stalk (peduncle) at flowering would be beneficial to harvest higher yield of saffron in flowers and would also be harvested more easily.

Jaiswal and Sharma (1990) revealed that preparation of land, unavailability of seed, lack of knowledge, method of seed treatment, lack of irrigation were the major constraints in adoption of improved technology of rice.

Munshi (1990) reported that the marketing of saffron is concentrated in the hands of a few traders and exporters and suggested that village level marketing societies be established in order to eliminate
intermediaries and ensure farmers a single price which represents a true market value.

Negbi (1990) reported that the planting depth of the seed corms has affected the daughter corm production.

Sadegi and Razvi (1990) reported animal manure, NPK have been observed to effective in weight increase and number of big corms which in turn was effective in enhancing flower yield of saffron.

Sarma et.al. (1990) reported that the crocin and picrocrocin contents were lower in the regenerated stigma structures by six to eight times respectively as compared with natural stigma.

Shrivastava and Singh (1990) reported that high price of fertilizer, lack of technical knowledge, lack of capital, non-availability of credit as the constraints faced by majority of the respondents.

Singh and Sharma (1990) found that some of the major constraints were lack of finance for the purpose of inputs (84%), lack of knowledge (81.7%), high cost of HYV seeds (75.09%) and shortage of irrigation facilities (58.76%). The other constraints included non-availability of inputs on time (58.76%) followed by incidence of pests and diseases (48%).

Singh and Sharma (1990) found that small and marginal farmers are more prone to adopting incorrect production practices than medium and large growers. The technological gap, however, is noted to be high in
all the three categories of growers for Rhizobium inoculation, seed treatment and N, P and Zn application.

Jafarpur (1991) reported corm rot as an important diseases of saffron, which gets multiplied year after year in the field because of longer planting cycle and primitive agronomic practices in vogue is responsible for poor saffron crop.

Juliana, Annamalai and Sema (1991) concluded that adoption of IPM was positively and significantly associated with extension agency contact irrespective of marginal, small and big farming.

Kadrekar (1991) stated that the production of pulses and oil-seeds in the Konkan region could be increased with concentrated efforts with regard to proper technological back-up, diversification of cropping pattern, marketing and price support and appropriate extension efforts.

Khaki and Rahimi (1991) reported that scientific drying improves the quality of saffron by 61.05 percent and saves time as the traditional sun drying takes 27-53 hours.

Lakhera and Punjabi (1991) investigated on constraints of fertilizer use and learnt that high cost of fertilizer ranked first followed by lack of guidance and unavailability of credit second and third respectively.

Obeldieck (1991) reported although costly, saffron is still used as a spice apart from pigments (Crocin and Carotenoids), it contains the flavour compound safranal and bitter compound picrocrocin.
Prasad and Pal (1991) observed lack of credit, lack of knowledge and non-profitability of fodder and low market value of grain are the major constraints in the adoption of practices in black soils. While almost the same constraints were identified for cultivation of sorghum in red soils.

Sharma, Oberoi and Moorti (1991) found the most important input, which is expected to raise out-put substantially, is working capital, while fertilizer shortages are viewed as a major determinant of the technological gap.

George et.al. (1992) concluded saffron propagules have low capacity of regeneration are subjected to viral and fungal infection, so micro-propagation of saffron multiplication has been advocated to be the best alternative for its propagation.

Pruthi (1992) reported on the aspects of post-harvest processing activities which include washing, peeling, pricking, balanching / scalding bleaching, curing, drying, cleaning, grading and packing.

Vekaria, Mahajan and Pandya (1992) concluded that the extension contact, personal cosmopolite source, mass media source and source of information were positively and significantly related with input use behaviour in case of total sample farmers.
De-Mastro and Ruta (1993) observed a positive relationship between corm size with number of flowers per corm and weight of stigma lobes.

Ingole, Dakhare and Dikle (1993) concluded that attitude was positively and significantly correlated with knowledge of dairy farmers.

Santha, Shylaja and Asan (1993) concluded the main constraints to adoption of most of the recommended practices were of an educational or economic in nature.

Jha and Shiyani (1994) found that various socio-economic variables are responsible to the variation of technological gap in cattle rearing practices.

Munshi (1994) observed the highest number of flowers and cormlets were found in treatment receiving N and K at 30 kg/ha and P at 40 kg/ha. Also reported plant height, the number of shoots, flower FW, stigma and style FW and DW and the yield of saffron were also significantly increased compared with the control treatments.

Sadegi (1994) found that big corms of saffron produce more yield in the first year and with the multiplication produce more corms and increase the capacity of flowering and yield in the second and third year.

Wani (1994) stated that the saffron growing soils are slightly alkaline in reaction, normal in soluble salt content the organic carbon available N and P of these soils are low to medium.
Bharathi, Dhave and Chandaram (1995) told that attitude score of the women respondents indicate that they had more conservative approach as regard to caste interaction with attitude.

Ray, Chatterjee and Banerjee (1995) Identified, the weak organizational system, low quality of working life, lack of adequate compensation, lack of organizational stability, lack of adequate authority and responsibility, lack of suitable organizational climate were the constraints in the adoption and continued use of technology.

Arya and Malik (1996) studied on the components of technology and found that the adoption of fertilizer application and plant protection methods was the lowest of all the components, also found that the technology gap was highest in the smaller farms.

Deep, Punia and Punia (1997) found that caste, education, family education index, cultivated land, contact with ADO’s, economic motivation, scientific orientation and risk preference were not significantly correlated with the adoption of green manuring.

Khaki et al. (1997) reported, the most important factors that reduce saffron quality are method of harvesting saffron flowers, method of separating stigma from flower, method of drying, preservation, packing and marketing.
Padmaiah and Rao (1997) reported that extension contact, mass media exposure and income were positively correlated with adoption behaviour.

Rekhi et al. (1997) reported lack of high yielding cultivar, the serious weed cyperus rotundus; corm roting and gangrane disease, rats and moles as serious pests which eat corms, lack of research on potential for use of other floral parts besides the stigmas, isolation of stigma and sun drying affects saffron colour were the main technical problems faced by saffron growers.

Sadeghi, Aghamiri and Negari (1997) found that increases saffron recovery was associated with increased number of flowers per hectare, which might be due to more activation of buds. An additional benefit of Rs. 30440 is generated through the adoption of low cost sprinkler system of irrigation.

Sarkar (1997) found that age, acreage of mulberry garden, income from sericulture, mulberry leaf yield and cocoon yield showed a high, positive and significant association with adoption behaviour.

Sharma, Sharma and Singh (1997) concluded that the education level and the size of the land holding influences the adoption rate of improved practices of cotton growers. Adoptability was hampered by the constraints, untimely supply of seeds and chemical fertilizers, inadequate credit facilities, non-availability of reliable seeds and high cost of chemical fertilizers.
Anonymous (1998) the saffron is cultivated in J & K and Himachal Pardesh in an area of more than 1000 ha with an annual production of more than 10000 Kgs.

Jha and Ola (1998) reported that age, cropping intensity, size of holding, irrigation potential and education were contributed significantly to variation in technological gap.

Jha, Ola and Chaudhary (1998) reported that there is a wide technological gap between recommended technologies and their use in farmers field particularly in weed control, followed by plant protection measures, post harvest technologies and water management. The least gap was observed in thinning.

Nagabushanam (1998) reported that the factors like education, land holding, mass-media participation and innovativeness were found to have a significant relationship with knowledge.

Sahdev et.al. (1998) reported that the highest technological gap was in plant protection measures followed by manure and fertilizers and irrigation management, while the smallest gap was observed for varietal recommendations, harvesting and post-harvesting operations in mid and high-hill situations. The typical socio-cultural traditions and strong religious beliefs constrained the tribal community in adopting modern farm production technology.
Trilochan, Kherde and Singh (1998) reported that dairy farmers with a low level of family education status, less knowledge about dairy farming practices and a low level of mass-media exposure had a high level of technological gap with respect to recommended dairy farming technology.

Wabhitkar et.al. (1998) reported that education, land holding annual income, socio-economic status, economic motivation, risk preference, management orientation, cosmopolitan attitude, contact with extension agencies and mass media exposure were found to be significantly related to adoption. Age and scientific orientation were not significantly related to adoption.

Desai, Patel and Patel (1999) revealed that the most important economic constraints faced by mango orchard growers in adoption of drip irrigation sets were: high cost of spare parts; heavy initial expenses for installation of drip irrigation system and lack of capital for covering entire area under drip irrigation system.

Azizbekova and Milyaeva (1999) reported that treating of dry saffron corms with growth regulators (gibberellins + kinetin) during June-July promoted the formation of additional flower buds, this led to the accelerated formation of more flowers, which in turn increased saffron yield.

Borah and Bhagowati (1999) found that the most frequently cited reasons for non-adoption / partial adoption were high investment
followed by inadequate availability of finance. Education and economic status of farmers were found to be positively related with adoption.

Grilli (1999) found that continued selection of well developed corms from sub-population has led to the improvement of certain characteristics such as long red stigmas.

Neeraj, Ram and Singh (1999) revealed a wide technological gap and the need for training and transfer of technology to improve the productivity of hill farming.

Singh and Singh (1999) found, education, annual income yield of mustard, farm power, experience, overall knowledge, attitude, economic motivation, risk taking ability and level of aspiration, showed significantly positive and linear relationships with adoption of mustard technology.

Sud, Paul and Thakur (1999) reported, the use of healthy corms followed by application of Bavistin or Tecto @ 0.2% as a drench gave complete disease control in the subsequent years appeared to be the best management strategy.

Tyagi (1999) reported that education, attitude, extension contact, credibility were negatively and significantly related with the technological gap by all the farmers, no significant correlation was found between the caste of small, medium and big farmers and their adoption behaviour.
Barman, Pathak and Kalita (2000) found that farmers by and large used less than 40% of the production recommendation of ahu rice. Education, annual income, utilization of personal cosmopolite, source of information, training exposure and knowledge of the farmers had significantly negative correlation with the technological gap.

Dahake et. al. (2000) concluded that knowledge of the application of NPK doses through drip was not found with any farmer, non-availability of spare parts, lack of technical knowledge and inadequate service and guidance from dealers were the major constraints in adoption of drip irrigation system for orange trees.

Khandekar and Sharma (2000) revealed that a medium level technological gap existed with regard to management practices, however there was a low technological gap in feeding and a high technological gap in health practices.

Kumari and Sharda (2000) found that majority (50%) of the vegetable growers obtained medium scores, while equal number of respondents for non-vegetable growers obtained low and medium scores (43.3%) regarding their knowledge, attitudes and practices in relation to the benefits of vegetables.

More and Jadhav (2000) reported that education, socio-economic status, mass-media exposure, extension contact, scientific orientation, level of aspiration and risk preference had a positive and significant relationship with adoption of cotton production practices.
Rai *et al.* (2000) reported that farmers in the low category had high levels of technological gaps with regard to recommended varieties, fertilizer use, time of fertilizer application and intercultural practices for four crops, wheat, rice, arhar and gram. Major constraints were lack of information about suitable crop rotation and mulching techniques.

Rangari *et al.* (2000) found that education, annual income, landholding, socio-economic status, extension contact, social participation, achievement motivation, risk preference and scientific orientation were positively and significantly related to adoption of pomegranate production technology.

Sagar and Dohare (2000) reported that, education, occupation, annual income, extension participation and awareness of goat cooperative society were positively and significantly correlated with the adoption of health care in goats.

Sama, Raima and Bhatia (2000) reported that the quality of saffron produced in India is poor due to out dated processing practices, the main deficiencies being contamination with dust and pollens and low pigment content.

Sharma, Arvind and Kumar (2000) reported that attitude, awareness, socio-economic status, farm size and off-farm income have a positive and significant influence on the adoption of agroforestry innovations.
Singh, Prakash and Kumar (2000) concluded that a considerable gap exists due to technology dilution from one production station to another, particularly between experimental plots and farmers fields, is due to differential adoption of technology.

Singh et.al. (2000) reported that lack of knowledge, non-availability of soil testing results, no approach by the soil testing department and lack of time for the farmers were the main reasons for the technological gap.

Torkamani (2000) found that the technical efficiency of saffron growers indicated that there was a considerable possibility of increasing production by increasing farmers efficiencies.

Yadav and Singh (2000) revealed that high cost of fertilizers, unawareness regarding recommended doses and lack of technical guidance, lack of knowledge and lack of extension services were the major constraints responsible for the gaps.

Desai et.al. (2001) found that majority of the mango orchard growers (66.86%) had moderately favourable attitude towards drip irrigation system, followed by (18.28%) with less favourable attitude.

Girja and Shivamurthy (2001) revealed that the attitude of Horticulture Producers Cooperative Marketing and Processing Society (HOPCOMS) and other channel (OC) users does not have favourable attitude towards HOPCOMS.
Khaki (2001) reported harvesting of completely open flower increases the yield of saffron.

Munshi (2001) revealed that unawareness of the marketing channels, lack of efficient post harvest techniques, small land holdings and poor economic back-ground are the major problems encountered by saffron growers in Kashmir Valley.

Naresh et. al. (2001) found that both non-tribals and tribals had maximum knowledge gap with regard to health and hygiene (77.09%) and 80.36% respectively. In terms of adoption gap, milking practices among non-tribals and feeding practices among tribals exhibited the maximum gap (81.10 and 89.87%).

Patel et. al. (2001) revealed that there was a significant difference in technological gap between farmers with small and large holdings.

Prakash and Bahal (2001) observed lack of finance (93%), lack of transportation (84%), high cost of inputs (82%), non-availability of plant protection (48%), non-technical guidance (27%), lack of knowledge (56%), high rainfall (76%) and lack of marketing (61%) were the main constraints of hill agricultural technologies and perceived by farmers.

Reddy, Sasidhar and Reddy (2001) found that most of the farmers (37.50%) had negative attitude followed by positive (31.63%) and neutral (30.83%) attitudes towards dryland agriculture technology.
Resmy, Shramurthy and Tapre (2001) observed lack of knowledge (88.3%), lack of technical guidance (86.66%), high cost of fertilizers (68.33%) irregular supply of electricity (35%) and low profit (31.66%) were the main constraints in adoption of coconut and banana practices in Alappuzha Kerla.

Sanjay, Lal and Singh (2001) concluded average gap in weed management practices in rice crop was 25%, maximum average technological gap 31.4% in wheat crop was found in case of chemical weeding followed by integrated weed management 20.3%.

Sawarkar, et.al. (2001) reported that social participation, scientific orientation, extension contact, utilization of information sources knowledge about and attitude towards A.I. had a positive and significant influence on the extent of adoption among dairy owners.

Shivalingaiah, Anand and Rajana (2001) reported that respondents have low level of knowledge and adoption level in majority of the recommended water melon cultivation practices.

Thyagarajan and Ramanathan (2001) pointed out that farmers should be convinced properly on bio-fertilizers by conducting result demonstration, organizing field tours, arranging group discussions etc. and this will increase the usage of fertilizers at farm level.

Varmudy (2001) reported that after post harvesting, drying and packing are the most important components in marketing of saffron.
Yadav, Singh and Sohi (2001) found that age, formal education, size of land holding and extension contacts did not show any association with the level of technological gaps of nitrogenous fertilizer dose application of paddy and maize growers.

Gupta and Srivastava (2002) found that the maximum technological gap was in the use of seed treatment (94.51%), whereas the lowest was in irrigation management (43.42%). The results also indicate that almost all the improved practices need to be taken into consideration to attain higher soyabean production.

Prasad (2002) found that farmers mass-media exposure, extension contact, education, income, farm power and risk orientation had a significant relationship with the adoption.

Singh (2002) concluded that the increase in production of food grain was possible as a result of adoption of quality seeds, higher dose of fertilizers and plant protection chemicals, coupled with assured irrigation.

Sube et al. (2002) reported that the maximum technological gap was found in case of compost preparation, the mushroom growers faced non-availability of quality spawn, difficulty in compost making, difficulty in maintaining proper moisture in compost, absence or scarcity of agro-processing units.
Zakaria et al. (2002) studied the per hectare yield are very low due to non-adoption of recommended horticultural practices by mango-growers.

Das and Pal (2003) found that there was a large gap between the farmers' practice and the research station practice for transplanting date, harvesting date and levels of NPK application for kharif paddy.

Goswami et al. (2003) revealed that high technological gap was observed in case of application of manure and fertilizers and use of pesticides, majority of the farmers have medium technological gap.

Molina et al. (2003) concluded that saffron bulbs are lifted from the field from May-June, stored for different durations at 23-27°C and forced to flower in a green house at 17°C. This storage temperature manipulations allows programmed flower formation of flowers during four months from early Sept. to mid-Dec.

Verma, Munshiand and Popat (2003) revealed that the variables size of land holding, income, knowledge, cropping intensity and technological gap were correlated with the pod yield of groundnut. The contribution of knowledge and technological gap to pod yield of groundnut was 54.36%.

Vinod, Singh and Mishra (2003) reported that the main constraints as perceived by farmers were, erratic power supply for irrigation
(91.75%), lack of transport facilities (85.75%) and unavailability of plant protection chemicals (85.75%).

Abdollah (2004) focusing the effects of temperature, soil, corm size, planting date, plant density, planting method, irrigation, fertilizer application and weed control based on both traditional and scientific knowledge on saffron production and provides some recommendations for efficient saffron cultivation.

Bhairamakar et.al. (2004) observed high cost of inputs was one of the important constraint to adoption of improved cultivation practices.

Bolandí et.al. (2004) reported that the time of storage and drying method have significant effects on chemical properties such as colouring strength, aroma and bitterness value.

Chaudhary and Bandyopadhyay (2004) revealed that production orientation, mass-media exposure, economic motivation, market orientation and holding size have a substantial effect on technological gap in mango cultivation.

Dalvi et.al. (2004) indicated that non-availability of hybrid soyabean seed in time, high cost of seed, shortage of FYM, high cost of fertilizers, insecticides, pesticides, non-availability of fertilizers in time and non-availability of labours were the constraints faced by growers. The extent of technological gap was 25.90% for plant protection, 22.58%
for fertilizer use, 18.09% for FYM/compost use, 17.33% for seed
treatment, seed and sowing 12.07%.

Ghosh, Goswami and Mazumdar (2004) found that among socio-
economic variables age and education of the respondents were
significantly correlated with adoption of improved animal husbandry
practices.

Koocheki (2004) reviews the indigenous knowledge in agriculture
with an emphasis on saffron production in South Khorasan, Iran. The
technological, socio-economic and cultural aspects of saffron production
system are also discussed.

Molina et.al. (2004) reported that extension of harvest season in
the green house from early Sep.-late Jan. with a saffron, spice yield per
corm higher than 17mg.

Nahvi (2004) concluded that healthy corms should be dipped in
fungicidal suspension before sowing, application of FYM @ 175 q/ha
organic fertilizers @ 30:20:15 kg/ha (N:P2O5:K2O) gives higher yields.
He further reported for accelerated growth of roots and floral primordia,
the saffron crop should be sprinkler irrigated @ 70m³/ha at an interval of
7 days.

Nahvi (2004) reported that for controlling of corm rot disease,
cultivation of saffron under shorter planting cycle, planting of corms free
from rot lessions, initial treatment by copper oxychloride 50 wp. @ 0.05% or captan 50 wp @ 0.20%.

Nahvi (2004) reported that the major constraints to the quality saffron production are lack of high yielding clones, longer planting cycle, planting of non-graded corms, planting of corms without proper fungicide treatment, non-application of organic manures, absence of irrigation, poor post harvest technology. He further reported that the biggest constraint in horizontal expansion of the area under saffron is the lack of sufficient and quality rich planting material.

Rudra, Ghosh and Mukhopadhyay (2004) concluded nine major causes of low productivity unavailability of suitable early maturing variety, inappropriate cropping plan and delayed sowing, traditional method of cultivation, poor quality seed, minimum and imbalanced use of fertilizer, micro nutrient deficiency, lack of proper plant protection measures, lack of proper seed storage technology and lack of technical knowledge and skill.

Zargar et. al., (2004) investigated that the production of large sized corms, management of plant depth, the shorter plant cycles, higher biomass production, application of growth regulators and extension of harvest period of saffron, so as to increase the productivity.

Iqtidar, Tahir and Sadozai (2005) found that 40% of farmers did not know the recommended doses of fertilizers, while 20% used organic mansure, poverty, lack of financial resources and high price of fertilizers
seemed to be the limiting factors. 78% of farmers did not know about seed treatment of wheat. The major problems of growers were weed infestation, water deficiency, high fertilizer prices and fungal infestation.

Mohmmadi and Reiyan (2005) reported that due to high temperature in Sabzevar during reproductive stage, the qualitative and quantitative characters of the product were lower than the product produced in Southern parts of Khorasan. In Sabzevar, it is necessary for saffron to spend 25 days to receive daily energy.

Molina et.al. (2005) found that the optimal temperature for flower formation was in the range from 23-27°C, 23°C temperature being marginally better. Incubation of the corms after lifting at a higher temperature (30°C) reduced flower initiation.

Prasad and Joseph (2005) revealed that the technological gap was significantly less in the adopted than non-adopted villages and education, economic motivation, credit orientation, extension contact, management orientation and mass-media exposure played a significant role.

Sadighi and Kakhak (2005) found a positive relationship between farmers attitudes and their level of professional knowledge, their agricultural experience and their crop yields. Water shortage, price instability and poor economic conditions were the main problems faced by the saffron growers.
Sourav et al. (2005) revealed that adoption of improved practices in goat keeping is significantly and positively correlated with education, family educational status and communication source.

Tajiani and Koopahi (2005) reported that by increasing the export price relative to the domestic price with an expansion of saffron production capacity would result in an increased export supply of saffron.

Acharya, Pradhan and Biswas (2006) found that farm size, educational attainment, scientific orientation, attitude towards discontinuance contributed predominantly in characterizing the technology socialization process in the form of discontinuance.

Aga and Shah (2006) reported that in the last ten years from base year 1994-95 to 2004-05, the area under saffron as well as production has declined from 130 quintals to 48.15 quintals showing a decline of about 63% in production. The statistical data also shows a decrease of 32% in area under saffron from last ten years.

Aga et al. (2006) studies that saffron needs irrigation from mid Aug. to Sept. at ten days interval, as it activates floral primordia and help in corm multiplication. Also revealed that about 5 lakh corms are required for planting one hectare of saffron land at a spacing of 20x20cm.

Bhagwan and Chauhan (2006) reported that majority of the mungbean farmers had high technological gap in high yielding varieties,
seed treatment, application of organic manure, application of nitrogenous and phosphatic fertilizers and plant protection.

Kavaskar and Santha (2006) revealed that age, educational status, occupation, farm size, farming experience, social participation, extension agency contact, mass-media exposure, credit orientation showed a positive and significant association with adoption of banana growers.

Popat, Rakholia and Verma (2006) observed that size of land holding, social participation, employment status, opinion leadership, extension participation, localite-cosmopolite, value orientation, knowledge and attitude were significantly correlated with the technological gap.

Waman, Wagh and Girase (2006) reported that education, social participation, extension contact, level of knowledge and level of adoption were the factors responsible for technological gap of banana production technology.

Zehan, Kangar and Sepaskhah (2006) reported that the production of corms (number and size) may be affected by irrigation method or frequency and observed basin irrigation with irrigation frequency of 24 days is preffered over furrow irrigation, due to lower water consumption and production of large size corms which is effective in flowering.
Aga (2007) studied that the biggest constraint in cultivating saffron is that net return in the first year is low because of very high establishing costs and prevalent drought.

Shah (2007) reported that majority of the saffron growers (60%) had neutral attitude, followed by favourable attitude (25%) and by unfavourable attitude (15%) towards saffron cultivation.

Singh et.al. (2007) found that majority of medium farmers showed partial gap in adopting the recent technological practices. However in plant protection practices, marginal farmers showed full and partial gap.

Vinod (2007) found 59.5% of the respondents belonged to medium technological gap followed by high and low technological gap in potato production cultivation by 23 and 17.5% respectively. The variables, education, size of land holding, occupation, farm power, transportation, irrigation sources, annual income and extension contact were found highly negatively significantly correlated with technological gap.