REVIEW OF LITERATURE

A comprehensive review of relevant literature is very essential for any scientific research. It provides not only the information of the work previously done in the field but also supports the methods and procedure. It provides a sound basis for operationalisation of the research and major concepts.

In order to arrange the review of literature meaningfully, it was been divided in four parts in this dissertation. A perusal of earlier researchers revealed that studies on "Impact of First line extension activities of ICAR in NEH Region" were quite limited. However, an humble attempt has been made in this chapter to present a brief review of literature available Indian as well as in the foreign studios.

The review of relevant literature is arranged in four parts as per the objectives. They are:

A. Level of knowledge and adoption by the Farmers.
B. Adoption behaviour of the farmers in relation to their socio-economic Characteristics.
C. Feedback Mechanism of first line extension activities.
D. Constraints in Adoption.
A. **Level of knowledge and adoption by the Farmers.**

**Knowledge:**

Taylor and Miller (1978) stated that education was positively related to knowledge of innovations and socio-economic status was negatively related to knowledge.

Vijayaraghavan and Somasundaran (1979) reported positive and significant correlation between knowledge level of the farmers and education, farm size, localite cosmopolite, value orientation, economic motivation and risk preference. They also reported non-significant relationship between knowledge and age, occupation, social participation and scientific orientation of the farmers.

Nikhade et. al. (1986) found that occupation of the farmers was related to their knowledge level of improved agricultural practices.

Thakrar (1986) revealed that majority 78.67 percent of the respondents had medium level of knowledge, followed by 11.33 and 10.00 percent of the respondents having low and high level of knowledge respectively.

Jain (1987) concluded that there was highly significant relationship between the knowledge level and extent of adoption of respondents. Similar finding was reported by Prassad (1980).
Reddy and Reddy (1988) concluded that the variables such as farm power, farm size, scientific orientation and risk preference were positively and significantly correlated with knowledge of the farmers.

Sinha et al. (1988) found significant and positive correlation between knowledge level of the farmers and education, land holding, caste, socio-economic status, economic motivation, scientific orientation and risk preference. They also found that the variables i.e. age and social participation of the farmers were neither associated nor correlated with level of knowledge of the farmers towards wheat demonstration.

Patil et al. (1989) observed that 100 per cent farmers had knowledge about improved seed, seed treatment, recommended seed rate, while use of chemical fertilizer 77.27 per cent and control of pest and diseases 63.63 per cent was known to the majority. Very few farmers had knowledge about recommended spacing 12.72 per cent about improved practices.

Sekhwat (1989) found highly significant difference in knowledge level between lab to land farmers and Non lab to land farmers with regards to all recommended practices of mustard cultivation. Further he reported highly significant correlation between level of knowledge and age, caste, education, farm power, farm implements and sources of information of the lab to land and
on lab to land farmers. Similarly non significant relationship as reported between social participation, occupation, size of land holding and credit behaviour and knowledge level of both categories of farmers. He also reported predicator variables for knowledge such as education and caste for lab to land farmers and education and farm implements for non-lab to land farmers.

Singh and Patel (1990) found that age, caste and land holding size of farmers were not related to the level of knowledge regarding improved farm practices.

Sup et. al. (1990) concluded that social participation had positive relationship with knowledge level of farmers related to farming and allied technology.

Trivedi and Patel (1990) concluded that the trained farmers had significantly higher knowledge about improved agricultural practices as compared to un-trained farmers. Similar conclusions were drawn by Tripathi (1985) and Reddy (1989).

Trivedi and Patel (1990) found that majority of trained farmers (70 per cent) were found in high level of knowledge group, whereas majority of the un-trained farmers (86 per cent) had a medium level of knowledge regarding Maize production Technology. It was also found that there were highly significant differences between trained and untrained farmers with respect to their
wledge level regarding improved practices of Maize crop.

Sundarawamy and Bavalatti (1991) found that majority of respondents (57 per cent) belonged to medium knowledge level category. Almost equal number of respondents were in high and low knowledge level categories of farmers.

Veer Krishna et al. (1991) reported that occupation, farm implements, social participation, credit behaviour and sources of information utilized were significantly and positively correlated with level of knowledge of the farmers but ge was negatively significant correlated with knowledge level. key were also found that age and education were important variables in the regression analysis for the knowledge level of the farmers.

Patel and Patel (1992) concluded that adopted farmers under J.L.P. has significantly higher knowledge regarding improved sandy cultivation than the non-adopted farmers.

Roy et al. (1992) The study revealed that majority of neficiary farmers (53.12 per cent) had high level of knowledge ile the majority of control group farmers (44.82 per cent) had lium level of knowledge. A closer investigation reveals fference in knowledge score between beneficiria and non eficiary (control group) farmers.
Sakharhar et al. (1992) reported that there was significant and positive correlation between knowledge level of the farmers and their characteristics like education, social participation, socio-economic status, risk preference, cosmopolitanism and mass media participation.

They also found non-significant relationship between extent of knowledge and land holdings, annual income, economic motivation and scientific orientation of the farmers.

Sharma (1992) concluded that for beneficiary (trained) crop producers, family size, credit and communication were associated with the knowledge index whereas age, education, caste, occupation, farm power and use of farm literature were positively associated with the knowledge index of non-beneficiary (un-trained) crop producers.

Chand (1993) reported highly significant difference in extent of knowledge between trained and un-trained farmers with regard to all eleven recommended practices of mustard cultivation.

Mahawer and Panjabi (1993) found significant difference between knowledge level of beneficiaries and non-beneficiaries about production technology recommended by personnel of SCAR project.
Sharma and Chuhan (1994) concluded that education, perceptions about change, farm power and risk preference for beneficiaries and i.e., caste, perception about change, land holding, farm credit, farm power cosmopolitaness and scientific orientation for non-beneficiary respondents were found as to be best predictors for extent of knowledge about recommended size production technology.

Sarmah (1994) reported the increasing the productivity of winter rice by improving the knowledge of the farmers because there was roughly 10 per cent difference between knowledge and adoption gaps. The level of knowledge of the farmers on the production recommendation of winter rice is a progressive block in far from satisfactory.

ADOPTION:

Jaiswal (1965) in his study about the factors associated with level of adoption of improved agricultural practices, indicated that the degree of help received by farmers through extension agency and the degree felt need of the farmers for the improved practices were the most important factors amongst selected independent variables in influencing the adoption behaviour of the farmers.

Pothak and Dargan (1971) stated that the extent of adoption of improved implements through the impact of neighboring cultivators.
Who adopted new technology.

Jha & Shaktawat (1972) In their study found that age of farmers was negatively associated with the adoption of farm practices.

Pathak and Mazumdar (1978) found that farm power and Mass Media contact were the most important predicator for adoption behaviour of farmers.

Sinha (1980) revealed that economic motivation and scientific orientation of respondents was significantly associated with their extent of adoption. Similar result was found by Patil et. al. (1989).

Tripathi (1985) observed that there was no relationship between extent of adoption and social participation, caste and education of the farmers.

Nikhade et. al. (1986) Found the occupation of the farmers was related to their adoption of improved agricultural practices. Contrary finding was found by Battacharya (1985).

Reddy and Reddy (1988) concluded that variables such as education, caste, family size and scientific orientation were found significantly related with adoption. Further they found that some
Vekaria and Mahajan (1990) found that education, social participation, annual income and socio-economic status of the farmers were positively and significantly related with their extent of adoption of agricultural technology but negative significant relationship was found between age and adoption of the farmers.

Dangi and Intodia (1992) revealed that the contacted and follower farmers have shown a significant gap in the adoption of most of the improved practices of wheat and cotton cultivation. Hence, the intensive efforts under the programme have still to be made to minimize the existing gap.

Sakharhar et al. (1992) found positive and significant correlation between extent of adoption of farmers and education, social participation, annual income scientific orientation, risk preference, cosmopolitan and mass media participation of the farmers.

Sharma (1992) also reported the family size and credit had significant and positive correlation with adoption index of beneficiary crop producers. Whereas, age, farm literature were positively and significantly associated with the adoption index of non-beneficiaries crop producers.

Patel et al. (1992) reported that more than half of the respondents (54 per cent) were belonged to the category of medium
extent of adoption while, the respondents belonged to low extent of adoption were next in order (27.23 per cent) only 18.86 per cent of the farmers were found in higher extent of adoption category.

They also concluded that personal characteristics namely education, caste, social participation, social economic status, size of land holding, annual income and economic motivation were significantly associated at 0.01 level probability with the adoption level whereas, age had no significant association with adoption level.

Vekaria and Patel (1992) reported that majority of the farmers had possessed medium (51.90 per cent) level of input use behaviour (adoption) in irrigated farming. Further they found that the variables i.e. risk preference and economic motivation showed highly significantly positive correlation with input use behaviour of the farmers.

Chand (1993) reported that highly significant difference was observed in extent of adoption between trained and untrained farmers.

Patel and Patel (1993) concluded that the extent of adoption of improved practices of paddy crop was significantly higher in beneficiary farmers then non-beneficiary farmers. Further they also reported significant relationship between extent of adoption
and extent of knowledge of technology of both categories of farmers. Further non significant relationship were reported between extent of adoption and type & size of family, land holding and social participation of the beneficiary and non-beneficiary farmers.

Thangagew and Bezbroa (1994) reported that association between dependent and independent variables, education, social participation and income were found to be not related to the desired extent adoption, age was found to be negatively and significantly related to the extent of adoption. Size of holding, Extension contact, training and market orientation were found to be positively significant to the extent of adoption.

Sharma and Chauhan (1994) revealed that most of the selected characteristics were significantly correlated with the level of modernization, extent of knowledge, adoption and communication media expose of the beneficiaries as well as non beneficiaries.

B. Adoption behaviour of the farmers in relation to their socio-economic characteristics:

Ering (1969) In some of those tribal areas in isolated pockets, higher technology production compared to slash and burn agricultural was adoption but the process of mobilizing the surplus for further adoption of new technology to be achieved increased
productive capacity had been absent. In Arunachal Pradesh, the Manpas of Towang in Kamang district built terraces for practicing plough cultivation to produce wheat they manured their farms with mixture of oak leaves and night soil the Apa Tais of Subansini District have been practicing settled wet rice cultivation and were adopting an appropriate system of irrigation. Instead of ploughing their land they hoe it with spades. The Kampties of Lohit district they have their own ploughs which are drawn by he-buffaloes and even by elephants.

Mitra (1977) reported that tribal socio-cultural setting is the characteristic by particular socio-cultural reservations without disintegrating the qualities of cultures, the typical of which are the folk song and music, which is perfect expression of ecological balance in nature which has fostered above of honesty, truthfulness and freedom from inhibition.

Agrawal (1977) reported that the tribal and non-tribal interaction, conceived sub-tribal variation is socio-cultural process. He further added that the demographic, spatial, temporal and functional factors influenced the prices.

Michael (1978) described the social setting in Chota Nagarpur tribal and added that tribes have survived as different ethnic groups because of the isolation from the mainstream of Indian culture. He further pointed out that tribal people have limited
aspiration with regard to material and financial progress for them, social relationship, a life in harmony with ones surrounding matter more than just earning more.

Sadamate and Singh (1978) reported the physical settlements has isolated their communities in pocket specific settlement and religious and highly traditional life. He further reported that traditional tribal organization is more credible and is dominated by traditional and religious leadership pattern.

The Angamis and Chakesangs of Kohima district in Nagaland had adopted the methods of terraced wet rice cultivation drained terraces on hill slopes. Some farmers also adopted the system of rice-cum-fish culture on terraces by building small bits in each terrace for putting fingerling therein. During the rainy season where enough water supply is available, the rice field is kept in shallow submergence when fishes can swim around in the fields and grow bigger. As water recedes they go back to the pits.

Noah (1984) stated that in Africa, tribal groups usually believe in the intrinsic value of their own cultures and religious beliefs, can not survive change unless it is, some how in accordance with their normal attitudes and traditional customs.

Awashi et al. (1985) reported that the plot size cultivated by tribal farmer depends on the size of the family.
Bokul (1990) reported that although most of the tribes have joint families in the past it no longer exists today. There is a tendency of nuclear family organisation in place of the joint family structure.

Bhakat (1980) mentioned that the religious belief of the tribal people is that some deities reside in the forests has played a significant role in preservation of plant resources down the centuries. In this era of shifting cultivation and rapid deforestation such beliefs still serve in the hope for preserving the indigenous flora.

**AGE:**

Dhaliwal (1965) reported positive relationship between the age of the farmers and the adoption of agricultural innovations.

Singh and Prasad (1974) reported that higher adoption was with the farmers in the age group of 30-40 years.

Oliver et. al. (1975) reported that there is significant association between age and adoption of improved agricultural practices. Balasubramaniam (1980) did not report about the significant relationship between age and adoption behaviour of farmers.
Thangngew and Bezbara (1994) reported that age has negative relationship with the adoption.

**EDUCATION:**

Tripathi (1971) revealed that rate of literacy among the tribes of Orissa is very low i.e. only 9.5 per cent against 26.2 per cent of general population and only 2.6 per cent tribal families are literate.

Singh & Prasad (1974) indicated that education level of farmers was positively related with adoption of improved agricultural and dairy practices Sohal & Grewal (1971), Sinha (1974) and Hundal (1976).

Misra (1978) observed positive association between education of farmers and adoption of wheat technology.

Khuspe (1980) reported in the study that there was significant association between tribal farmers education and extent of agricultural practices.

Singh (1980) Mentioned about tribal education that education of family member help to shed the agricultural belief and create the congenial condition to adopt recommended technology. He further added that due to education, they had shed the belief and
become rational to use insecticide and poison baits to control insects and rats to save crops from damage.

Rao (1984) was of the view that education and training in skills for the poor, small and marginal farmers have the major blank of the anti-poverty Strategy. Poverty can be removed if the poor themselves become conscious, improve their education and capabilities become organised and assert themselves.

CASTE:

Mulay and Ray (1965) stated that support from one's caste group was an important legitimising force for the adoption of farm improved practices. Reddy and Kivlin (1968) reported that adopters of HYV tended to be those with higher ritual caste.

Hundal (1976) found the caste had high association with adoption of improved dairy practices. Desai (1979) pointed out that caste had no significant relationship with adoption of improved farm practices.

SOCIO-ECONOMIC STATUS:

Patel and Singh (1970) observed that most of the adopters possessed high economic status.
Singh (1972) reported that level of living of the farmers was positively and significantly related with the adoption of Nitrogen fertilizer.

Puri (1972) reported that socio-economic status had no positive relationship with the pattern of decision making process of farm practices sinha (1966).

Solanki and Thorat (1975) observed that socio-economic status of small farmers was not related with their adoption behaviour, where Reddy (1975) was of the view that most of the farmers who adopted high yielding varieties of rice belonged to high socio-economic status.

OCCUPATION:

Shety (1971) found that owner farmers are quicker innovators and more intensive users of modern techniques than tenant farmers.

SIZE OF HOLDING:

Reddy (1962) Rogers (1968) Sankariah and Singh (1967) and Naidu and Bhaskaran (1979), found that size of land holding is one of the important dimension in the process of adoption of improved practices.
MATERIAL POSSESSION:

Roy et al. (1968) found a significant relationship between material possession and adoption of HYV.

Swamy (1978) found no significant association between adoption and material possession among all three categories of farmers.

SOCIAL PARTICIPATION:

Kaul (1964) found that farmers with higher social participation had higher adoption of innovations.

Sinha (1971) reported that the farmers with higher social participation had higher adoption for the use of fertilizer and vegetable cultivation (Singh & Sinha 1972).

Singh and Prasad (1974) concluded that adoption behaviour of farmers was positively correlated to the social participation.

Singh (1979) concluded that the social participation did not have any impact on the adoption behaviour of farmers.

Pandey (1989) reported that the social participation has significant association between adoption of agricultural innovations.
exposure, respectively.

Ganesan and Munhiah (1992) found that the regression coefficient of the variables contact with extension agency and mass media exposure exhibited significant and positive influence and the variable socio-economic status showed significant negative influence on participation of farm leaders in agricultural development schemes.

Pulamate and Ramesh Babu (1992) concluded that mass media exposure was positively and significantly correlated with the knowledge about rice technology of the respondents of both categories.

Sakharkar et al. (1992) found positive and significant correlation between knowledge level and mass media exposure of the farmers.

Vekaria et al. (1992) concluded the personal cosmopolite media, mass media and sources of information (Pooled media) were significantly and positively correlated to input use behaviour (adoption) of all categories of farmers under command area.

**RISK PREFERENCE:**

Hoffer and Slangland (1958) report improved agricultural
practices were found positively related to risk preference.

Supe (1968) reported that there was a clear difference between adopters and non-adopters as regard to scientific value, risk preference and economic motivation.

Earnest (1973) and Ramchandra (1974) were of the view that risk taking willingness was positively related to farmers communication behaviour.

Pandey and Reddy (1980) reported that due level of education does affect that risk taking ability of farmers for adoption of agricultural practices.

Titus (1981) reported that level of education, economic status etc. of the farmers only help to minimize the degree of risk, but these should not be taken as yard-sticks for measuring the level of adoption.

ATTITUDE TOWARDS IMPROVED AGRICULTURE:

Attitude of tribal farmers towards farming has been reported as an important factor in agricultural development and this has been supported by Bose (1969) commission SC/St (1971) and Tripathi (1974)
Jalihal et al. (1973) reported that majority of the farmers had favorable attitude towards high yielding varieties of paddy.

Gupta (1976) observed that the favourable attitude towards dairy farming leads to higher adoption. Choudhary et al. (1993) reported that majority of Naga farmers had favorable attitude towards high yielding varieties of paddy.

**ATTITUDE OF SHIFTING CULTIVATION:**

Saikia and Hora (1971) stated that Jhum economy, the size of a family farm is directly related to the number of working members in the family.

Samanta (1982) found that the Tripura Tribal in Tripura had unfavourable attitude towards shifting cultivation. He also noticed that in many of Jhuming area, a considerable number of Jhum farmers have switched over modern settled cultivation from their traditional jhuming.

Rao et al. (1989) reported that the tribal Jhumia the tribal farmers hold favourable attitude towards shifting cultivation. They also reported that vast majority of them were aware of change for the worst in various aspects of environment around them and they perceived destruction of forest is mainly responsible for all such changes.
Binota Devi (1990) while describing shifting cultivation in
Mipur noted that output is quite less because of the traditional
mode of cultivation. She opined that due to their low socio-
economic and educational status the tribal farmers could not go
ahead for improved agriculture practices.

Kanjaraj Singh and Talukdar (1993) reported that efforts are
also to be made the Jhum as understand that some socio-cultural
advantages such as shifting cultivation in the accepted way of
life, observance of social or, religious reties ensure good
harvest, Jhuming land is free and Jhuming operations are celebrated
to developmental of right type of attitude towards scientific
farming.

C. Feedback Mechanism of first line extension activities:

Singh, Kumar (1965) reported that the result demonstration is
considered as the most important extension methods.

Rama Rao (1974) Reported that special projects have brought
about a silent economic revolution, a revolution that has made the
poor and weaker sections more prosperous. What is perhaps more
important is an awareness of the credit institutions that are
financing small farmers.

Mehta (1975) Stated that the special schemes are supposed to
Bernala (1978) Stated that the special programmes like SADA, AP, Integrated Tribal Development Project etc. with their more project approach produce limited impact.

Eledioglu (1978) Reported that performance feedback could be a very effective change tool if used properly and using performance feedback coupled with a reinforcement programme to build self correcting and adopting human systems could result in substantial benefits.

Sivaraman (1978) Stated the operational flood programme can also be adopted to the BAIF approach by suitable allocation of degraded forests for fodder tree plantation. Unless close attention is paid to this approach the poor sections will get no benefit from the operational flood programme.

Yates (1979) Opined that use of people feedback as a stimulus for behavioural changes in a relatively short time and in an efficient way.

Kulshrestha (1979) Reported that the major impact of operational Research project has been, that the farmers now looks to ORP for new technology and not for inputs as in the case of National Demonstration. The technology they adopt under ORP is long lasting unlike National Demonstration which lasts only until they get few inputs. ORP aims at giving the farmers the technology
ilored to their means and requirements and soil conditions.

Patil (1980) found that due to the agriculture development programme of Sugar co-operation and irrigation development activities there was an impact in adoption in crop production to the considerable extent, and in animal and poultry management practices also to great extent.

Chandran (1981) reported in his study of lab to land programme that farmers were benefitted much due to result demonstration and frequent visits of scientists to the fields.

Mishra and Jha (1985) in their study on the impact of lab to land programme concluded that the income of the farmers in north Bihar who participated in the Lab to Land programme was significantly higher from those of non-participant farmers.

Satyanarayana and Reddy (1989) reported the innovative farmers felt that instead of selecting few farmers in isolated pockets of different regions for transfer of technology by conducting result demonstration of National Demonstration they suggested whole village demonstration approach with active participation of farmers. Further they also suggested to continue such programme in selected villages for a longer period (3-5 years) for its effectiveness.
for research and management gap where as socio-economic constraints, operate for extension gap.

Rao and Reddy (1979) observed that:
- majority of the farmers felt that failure on the part of the officials to provide good prices to the produce.
- untimely supply of publications and
- Non-availability of seeds/fertilizer/pesticides/plant protection equipments were the main reasons for non-adoption.

Raheja et al. (1979) stated that the main constraints in the use of high yielding varieties of Jawar were:

- lack of funds,
- non-availability of seed
- high cost of fertilizers and plant protection chemical

The main reasons for non-adoption of fertilizer were:
- lack of funds
- high cost of fertilizer
- non-availability of fertilizer when needed.

For non-adoption of plant protection measures, the main reasons were:
- lack of funds
- high cost of chemical
supply not available when needed

Parsad and Singh (1980), Mehta and Parsad (1986) and Parsad et al. (1986) the specific constraints are:

- Increased cost of fertilizer.
- Economy in the use of fertilizers, land leveling and plant protection.
- Difficulties faced by farmers in getting credit.
- Fears that alkali lands after reclamation would attract the provision of land ceiling.
- Long time taken by concerned departments to supply electric connection to run tubewells.
- Lack of specialized extension staff earmarked to take upland reclamation in the state deptt. of agriculture.
- Frequent transfer of extension personnel even after attending specific land reclamation training programme.

Pattanik (1983) stated that there are many constraints, but these are not only of the programme alone but lies with the administration and implementation authorities who are involved in this programme.

Arya and Shah (1984) reported that small, scattered and skewedly distributed holdings, shortage of labour, unavailability of inputs and not getting credit in time along with lack of extension and training facilities were the constraints identified for slow
adoption of new technology of rainfed agriculture.

Meherotra (1984) stated that the benefit of different economic development programme is not reaching to the common people due to corruption at different stages.

Rao (1988) reported total non-adoption in respect of two practices viz. opening of furrow after every 10 feet across the slope and sowing the seed of stylo sam sps. on mounds. He further accounted that the small size of holding, lack of interest on the part of soil conservation staff, lack of finance are key reasons for non-adoption of social and water conservation practices.

Balavatti (1989) reported the substantial resources of non-adoption with regard to practices like zunggteracing, stable mulching and ridge and furrow method of cultivation. He further stated that the adoption of soil water conservation practices revealed that adoption was not significantly associated with personal, social, psychological and economic characteristics of the farmers.

Pandey (1989) reported the constraints are:
- Lack of Finance.
- Inadequate irrigation facilities.
- High rate of irrigation charges.
- High cost of fertilizer.
- Complex procedure of loaning.
- Lack of knowledge of various beneficial development programmes
  which are specially meant for small and marginal farmers.
- Biased attitude of block officials.

Sanghi (1990) concluded that maintenance of conservation
structure like contour bunds, graded bunds etc. by the farmers
deteriorated after the withdrawal of staff from the project area.
The improved practices although efficient theoretically, were
reported to be non acceptable to small farmers since it led to
clashes between themselves with regard to location of waterways.

Thangngew and Bezpora (1994) concluded that the non-adoption
was due to the lack of knowledge of pesticides, complicated
procedure for loan granting and lack of contact between farmers and
extension agents were the major problems perceived by the farmers.

Wayal et al. (1994) reported that the lack of knowledge was
the main constraints in increasing fish production.

Sharma and Chauhan (1994) concluded that the main constraints
experienced by the farmers are:
- Poor transport.
- Poor input supply.
- High cost of advocated technology.
- Less information.
Singh, et. al. (1994). reported that lack of knowledge, lack of irrigation facility, lack of money, non-availability of inputs and lack of time are the main constraints for adoption of improved agricultural technologies.

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