

Methods of transferring wheat production technologies in india

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ABSTRACT

The population of the country is increasing with the rate of 1.5 crores people per year, whereas, foodgrains production has been static for the last few years. To feed the increasing strength of masses, it has been a challenge for the country to meet the food requirement. A systematic strategy and planning is required for meeting this challenge and providing food security to the bulging population of the country. In this direction, besides making sincere efforts like increase in the genetic potential of wheat varieties, increasing irrigation facilities, adopting suitable production technologies and developing suitable wheat marketing system, appropriate methods of TOT for increasing wheat production in the country are of utmost importance.

Keeping in view the above fact, the most appropriate and effective methods of TOT are :

Lecture, Extension talk, Group discussion, Workshops, Seminar, Symposium, Conference, Meetings, Case study, Brain storming sessions, Telephone calls, Skill teaching, Method Demonstration, Result Demonstration, Field Days, Exhibitions, Farmers Fair, Farmers Training, Office Calls, Farm and Home Visits, Campaigns, On Farm Trials, Video Film Show, TV, Radio, Farm Publications, Bulletins and Newspapers.

Key word : Wheat, India, transfer of technology

As per the academic estimate, by the year 2025 we need 109 million tonnes of wheat, whereas, at present we produce around 75 million tonnes. So, we need additional 34 million tonnes of wheat to feed the country's population in the year 2025. To bridge this gap, new high yielding varieties of wheat are to be developed. Infrastructure for agricultural production and marketing has to be developed to a large extent. Important irrigation system / facilities and the strategy for plant protection measures are to be the part and parcel of the prospective planning. To reap the harvests of all the above, a well planned system and methods of transfer of technology are required to bridge the gap in wheat production required to feed the Indian masses and export to get foreign currency.

TRANSFER OF TECHNOLOGY

Transfer of Technology (TOT), which is also called as extension is the process of transfer of technology from its source of generation (ICAR institutes, State Research Institutes and State Agricultural Universities) to its ultimate users i.e. farmers, through some TOT/extension agencies.

IMPORTANCE OF TOT FOR TRANSFER OF WHEAT PRODUCTION TECHNOLOGIES

The wheat is the major foodgrain being used by the masses for fulfilling their daily food requirement. Hence

their production is of utmost importance with the view point of feeding the increasing Indian population. In the current years, the European and Arabian countries have demanded wheat from India. Therefore, there is a need for developing and implementing an effective and result oriented TOT strategy for increasing wheat production.

The status of wheat production in the recent years is as follows.

It is clearly visible from above table that the wheat production is more or less stagnated since 1999-2000 which is not at par with projected demand of wheat in the country. Therefore, scientific and technological development, infrastructural development and marketing systems development, the appropriate system and methods of TOT for grain production in general and wheat production in particular is required. The Extension Scientists have conducted research and developed some very useful and important methods. Out of them, some important and useful TOT methods or extension teaching methods for transferring wheat production technologies are listed and described herewith.

Table 1 : Status of Wheat Production in India

Year	Area (million ha)	Production (million tonnes)	Productivity (Kg/ha)
1996-97	25.89	69.35	2679
1997-98	26.70	66.35	2485
1998-99	27.52	71.29	2590
1999-00	27.49	76.37	2778
2000-01	25.73	69.68	2708
2001-02	26.34	72.77	2762
2002-03	25.20	65.76	2610
2003-04	26.60	72.16	2713
2004-05	26.38	68.64	2602
2005-06	26.48	69.35	2619
2006-07	27.99	75.81	2708
2007-08	27.70	74.81	2701

CLASSIFICATION OF TOT METHODS

A - KNOWLEDGE BASED TOT METHODS

Lecture
 Extension Talk
 Group Discussion Methods
 Symposium
 Seminar
 Conference
 Workshops
 Meetings
 Case Study
 Brain Storming Method
 Telephone Calls

B - SKILL BASED TOT METHODS

Skill teaching
 Method Demonstration
 Result Demonstration
 Field Days
 Exhibitions
 Farmers Fair/ Krishi Mela
 Farmers Training
 Office Calls
 Farm and Home Visit
 Crop Campaigns
 Farmers' Educational Tour / Exposure Visits

C - IT BASED TOT METHODS

Video Film Show
 TV
 Radio
 Computer / Internet / Websites

D - MEDIA BASED TOT METHODS

Farm Publications
 - Periodicals and Magazines, Books and Booklets, Leaflets, Folders, Handouts,
 Pamphlets, Newsletters, Handbills, Wall-newspapers, Newspapers
 Circular letters
 Media Forums

TRANSFER OF TECHNOLOGY METHODS

LECTURE

In lecture most of the time flow of information is one way, i.e. from communicator to receivers. The interaction

between the communicator and receivers or audience is very less. This is most widely used method of TOT and also effective depending upon the communication skill of the Extension Officer.

EXTENSION TALK

Speech or talk by extension worker to a small or large group of audience is quite common method to share information. Formal presentation to provide information or technical skills require planning.

Man is bestowed with a gift of speech. He communicates with other in different situations to fulfill his needs and interests. But all the communication in the form of gossips, chit-chatting and loud talks are not planned. Hence, such talks cannot become extension talk. It is basically different from other talk and discussions. The extension talk can be defined as a "verbal explanation (or presentation or communication) to a group of people, to impart knowledge, by activating the learners". The flow of information in extension talk is two way and the interaction between communicator and receiver is much higher as compared to lecture method.

In TOT programmes, when we are mostly dealing with the adult learners, extension talk is the suitable and effective method for transfer of know-how. The adults always possess some knowledge and experience, hence they should not be treated as passive listeners. They must get sufficient opportunity to participate so that their valuable experience and knowledge could be utilized. So, extension talk should be the preferred over lecture method, while dealing with the adult learners.

GROUP DISCUSSION

The group discussion is defined as "the process of reactions and counter reactions between two or more than two persons, on a common subject, with the objective of achieving some specific conclusion or results". The group discussion is conducted to : Solve some problems, establish a consensus, get feedback, exchange ideas, share experiences, motivate group for some action, release tension, supplement the subject matter, remove doubts and to clarify vague issues.

It is a form of discourse or dialogue between two or more people to exchange information of a common topic with an aim to understand and/or solve the problem.

Group discussion is a very significant method for extension work. It assumes that the members involved in discussion are equal in status and every participant has some experience or information to contribute. It is specially suited to work with adults who prefer sharing of information than being instructed. The member are free to question each other. Thus, group discussion is specially helpful for exchange of experience and information, gaining better understanding of a problem, finding solution to a problem felt by the group, educating people in leadership skills and planning a programme of action.

ADVANTAGES

- It is democratic method giving equal opportunity to each participant.
- It creates high degree of interest.
- It helps people gain skills to work in terms.
- It develops group morale
- It enhances knowledge and critical thinking.

SYMPOSIUM

Symposium can be defined as a short presentation of lectures about a particular subject matter by 2 or 3 speakers with relatively high degree of competency on concerned subject matter. On some occasions a moderator is also involved. The presentation of subject matter may be formal and supplemented with teaching aids followed by informal discussion.

In symposium method, a major subject is divided into sub-heads and each sub-head is allotted to one speaker to speak on it. For example – in a symposium on wheat crop, one speaker each is allowed to speak on the sub-topics of field preparation, sowing of wheat, irrigation in wheat & so on and so forth. The important characteristics of this method are:

- 20-30 minutes to each speaker
- One moderator is appointed
- Presentation supported by visuals
- Panel discussion/Questions answer session after each presentation

The symposium technique has following distinctive advantages.

- 1) Complex subject and problems may be divided into component parts and presented by competent authorities.
- 2) Motivation for interaction between the extension agents and the audience gets enhanced as a result of presentation and different dimensions.
- 3) Accuracy and authenticity happens to be high in order, thereby ambiguity can be avoided

SEMINAR

In seminar method the speakers are allowed to speak on any aspect of the main subject. It is also followed by a panel discussion at the end. One moderator is also appointed for controlling the discussion. Each speaker/expert is given 20 to 30 minutes to speak. For example – in a seminar of wheat crop, any speaker can speak on any aspect of wheat production.

CONFERENCE

In conference method, only those scientists who have conducted research on a particular variety or practice or

procedure are allowed to present their research findings. One moderator is also appointed to control the discussion, presentations of conference are also circulated for use by the concerned persons/institutions.

WORKSHOP

In a workshop method, a major area/subject is divided into sub-heads. The members of the group are also divided into 3 or 4 sub-groups and each sub-group is assigned with a sub-head/topic for discussion. The results of discussion in each sub-group are presented in the general session. It is also followed by the panel discussion. The workshop method is adopted to bring out quick results on a complex problem/subject.

MEETINGS**(I) GENERAL MEETING**

It is an assembly of farmers in pre-determined place and time to facilitate presentation of new idea either by an extension worker or resource person for consideration and subsequent action by the concerned clientele. It is normally more popular in the early stages of extension. General meetings are the programmes in a particular geographical area, to make extension worker familiar with the farmers and also to bring together people of varied interests to focus the attention towards common problems.

MAIN OBJECTIVES

1. To make aware of TOT activities to many people.
2. To serve as a preliminary step to other TOT methods.
3. To know the farmers' reaction towards specific TOT activities.

(II) DISCUSSION MEETING

It is one of the TOT method in which mutual exchange of idea or face-to-face contact between extension worker and farmer takes place. It is an informal gathering of individuals with common interest with an extension worker providing necessary and valid information to stimulate frank discussion. The discussion meetings are important in different stages of diffusion of innovation to avoid ambiguity and motivate farmers to hasten decision making by individual farmers.

MAIN OBJECTIVES

1. To provide opportunity for total conviction about new idea presented by extension worker.
2. To create a permissive atmosphere to discuss different alternative solutions for problems and to arrive at a line of action.
3. To create a situation to make the individuals commit for action in the presence of fellow farmers.
4. To provide an effective forum to share the experience of one another about particular ideas in addition to getting information from the extension worker.

CASE STUDY METHOD

“Case Study” means learning through study of a particular individual evidence, or organization for its success or failure. To highlight the details of a particular individual from the view point of learning or getting informed is called the case study method.

The ‘Case Study’ method is an excellent medium for developing analytical skill. This method is a narrative account of a series of events or situations around a specific problem or problems. It is a written description of an actual situation, which provokes in the learner farmers the need to decide what is going on, what the situation really is or what the problems are – and what can and should be done. There are a wide variety of problems that could be part of a case study-relationship difficulties between people, loss or lack of funds, unclear roles between people who work together, bureaucratic system inadequacies, etc.

Case study is essentially problem identification, problem-solving activity. The technique does not demand decision or resolution at the end of the exercise. The main focus of the case study should be on thinking, talking and deciding about the many ways of solving the problem, and analyzing the factors which have contributed to the situation. This technique assists the farmers in developing analytical and problem solving skills. It is also useful in giving participants an opportunity to practice a method of tackling difficult problem before one is personally involved in a “real” situation that may be difficult, confusing, frightening or overwhelming.

Being an effective TOT method, which is gaining ground, it is suggested that the Extension workers of the organizations should encourage use of case study method. Though case study method is time consuming, it is a very effective TOT method, which brings out practical programme to the surface.

ADVANTAGES OF CASE STUDY METHOD

- (i) It enables the pooling of the experiences of a group of participants.
- (ii) It distributes knowledge and facts.
- (iii) It promotes the process of synthesis of several concepts and principles into one multi-faceted explanation or plan of action.
- (iv) It improves participants’ skills in problem analysis and communication. What is important in the case study method is not that you come to know of “right” answers, but that you learn different approaches to the solution of a problem. Your start appreciating others’ point of view and in the process change your attitude.
- (v) The case study method helps in group co-operation and improves interpersonal skills.

LIMITATIONS OF CASE STUDY METHOD

- (i) It is very time-consuming compared to more direct, expositive TOT methods.

- (ii) It requires the participants to engage in deep-processing of the general principles involved, through a process of reflection and abstraction, and the promotion and control of this process, in turn, requires special skills and expert knowledge on the part of the extension workers.

BRAIN STORMING METHOD

Brain storming is a group creative process, used to generate alternative ideas and suggestions in response to a stated question or problem.

PURPOSE OF BRAIN STORMING

- (i) Many alternative suggestions are generated in brain storming session.
- (ii) It generates alternative ways of looking at a problem.
- (iii) It is easy to identify persons, who have sound knowledge on the subject.
- (iv) Original and innovative ideas are generated through Brain storming.
- (v) Cross-checking of ideas is possible.

LIMITATIONS

- (i) In a session in which boss and sub-ordinate both are participating, sub-ordinate may not speak frankly.
- (ii) One or two persons may dominate the discussion.
- (iii) Some times ideas are not applicable.

TELEPHONE CALLS

Telephone call is one of the methods which creates fast contact between extension worker and farmer to exchange the communication.

ADVANTAGES

1. Farmer will develop confidence in extension worker and his office.
2. Desired information can be sent or pre-arrangements for extension activities can be made at cheaper rates and in short periods.
3. New technology can be communicated to selected farmers quickly.

LIMITATIONS:

1. Lack of telephone sets in rural areas.
2. It is difficult to understand the complicated subject matter in such a short period.
3. Mechanical disturbances hinder the smooth canalizing of communication.

SKILL TEACHING METHOD

Skill teaching is defined as “To train the learner, to perform a job, as quickly as possible, under supervision”. The skill means to develop practical ability in a person to

perform a particular task. In the process of skill teaching, extension worker performs a job, step by step. The learner observes the process and listens to the oral explanations carefully with intention to gain ability as how to perform a particular skill. Later on, learner repeats the demonstration given by the extension worker.

Today the modern and scientific jobs require a skilled person for economic and profitable level of production. The scientific production skills must, therefore, be developed for higher and profitable production. The extension workers must know what is "skill teaching", and must use this method in their programmes.

The learner must learn the 'why' as well as the 'how' of any thing/subject to be learnt. One may run into trouble

Method demonstration	Result demonstration
It shows how to use a practice	It show the end result/ outcome
It is quite appropriate to show working of new instrument or skills in a practice	Result of practice or product can be shown
It takes less time	It is time taking, involving all the steps to get results
No comparison is required	Comparison with old practice is essential

and he can not perform unless he knows how it will be done. Therefore, learning by doing is the best principle of learning skill. A skill teaching is the process of learning by doing.

DEMONSTRATION

This is one of the oldest TOT methods, equally applicable in many different situations to build confidence of people in new ideas and persuade them to try by showing. Demonstration means to show. Demonstrations should not be confused with experiment (trying new ideas under artificial conditions). Demonstration is showing proven techniques to reveal the procedure of doing or value of it. Simply speaking demonstration is a way of showing method (method demonstration) or result of a practice (result demonstration). However, there are differences between method and result demonstration as given below.

METHOD DEMONSTRATION

The purpose of demonstration is to present an improved practice in an interesting, convincing way so those people will appreciate its application and its desirability to their situation. Method demonstration is an important extension tool when a new skill or an improved practice is to be taught to a group. It essentially involves demonstrating people as to how to do something. Method demonstration is an effective technique since it involves the learner's sense; people learn best when all their senses are used. The TOT personnel who work with government extension services must be able to instruct extension workers on ways to carry out effective method demonstrations.

This TOT method is essentially directed to bring about changes in skills of the farmers in doing a particular practice. Initially extension worker shows how to perform a particular skill with all necessary explanation. However, the crucial and most important aspect of learning happens to be the opportunity provided to the participant farmers to practice the skill under the guidance of extension worker so that the necessary motivation is provided to repeat the same on his part.

OBJECTIVES

1. To provide learning opportunity under the contrived experience of learning a skill and possibility to continue as a habit till replaced by a new skill.
2. To teach the farmers to internalize the skills of some improved practices in local situation.
3. To create permissive atmosphere for simultaneous action by a group of individuals which in turn has greater multiplier effect about the adoption of skills, which is crucial in the diffusion of new technology.

ADVANTAGES

1. It provides an opportunity for seeing, hearing and doing skills in new practices.
2. It creates confidence in extension workers and agricultural scientists
3. It changes skills of agricultural practices at cheaper rate.
4. It is one of the effective media for making popular extension programme.
5. It can be used in different situations.

LIMITATIONS

1. It requires lot of pre-planning and efficiency.
2. If appropriate materials are not available, it reduces the educational value.
3. Not suited to all subject matter.
4. In some cases the effect of demonstrated skill may not be visible till a latter date.

RESULT DEMONSTRATION

Result demonstration, as the name indicates, refers to showing net worth of a practice/product like new variety, chemical control of pests, etc. It may be for a single recommended practice or a series of practices that come in sequence with respect to a problem. Result demonstrations do not only establish the value of a practice, but also prove the feasibility of the practice under local conditions.

Result demonstration is the TOT method which helps in convincingly establishing the validity of the improved agricultural practice under local conditions.

Result demonstration is considered as a complete method under extension technique as it involves all the

sensory perceptions of the learner. It is also said to be the combination of a number of teaching devices and it fits itself into individual, group and mass technique. It is an unique method by itself. The result demonstration is normally conducted on an individual farmers' field.

MAIN OBJECTIVES

1. To provide the convincing proof of the success of the innovation under the conditions different from the source of Agricultural Research Stations.
2. To motivate the neighbouring farmers to undergo the adoption-decision making process.
3. To provide enough conclusive evidence to the extension worker to start similar educational programmes elsewhere and
4. To furnish an opportunity for education of both farmers and others concerned.

ADVANTAGES

1. It establishes the local proof of the value of a new practice.
2. It establishes confidence in extension worker as well as farmers about new practice.
3. It develops contact between extension worker and farmers.
4. It is one of the media through which propaganda can be made about new idea.
5. It helps in TOT to extension worker, agricultural students and people interested in agricultural development.
6. It is an experimental station to educate farmers and farm leaders.
7. In case of successful demonstration, it stimulates agricultural Research Stations.
8. In case of successful demonstration, it stimulates agricultural Research workers.
9. It provides factual data.
10. It convinces farmers and extension workers through the principle of "seeding in believing".

LIMITATIONS :

1. It is not suitable for all advocated practices.
2. Sometimes results may be vitiated by uncontrolled factors like weather.
3. Finding a suitable farmer willing to keep records is rather difficult.

FIELD DAY

Field day is an TOT method designed to convincingly prove the efficacy of the important method over existing method preferably on result demonstration plot of the farmers, farmers organization, representative leaders and all

other concerned. This is the occasion to prove the efficacy of the extension programme.

MAIN OBJECTIVES

1. To assemble the representatives, farmers, extension workers of the organization.
2. To have clear understanding about the new method.
3. The ultimate proof of the technology gets tested.
4. To prepare for the bunch demonstrations and trial adoption in the local area concerned during subsequent seasons.

ADVANTAGES

1. Provides an opportunity for exchange of views and experiences.
2. Effective learning situation is created for discussion with subject matter specialists in local conditions.
3. Provides materials for mass contacts.
4. Provides basis for supply and services; for ceiling of agricultural finance.
5. Acts as nucleus for accelerated adoption of the technology in an area.
6. Provides first hand observation of situation.

LIMITATIONS

1. It is laborious method for extension workers.
2. It is difficult to find out suitable time for all concerned.
3. Unfavourable weather may unset the whole programme.

EXHIBITIONS

In recent days exhibition is gaining importance in agricultural extension activities. Briefly, exhibition means displaying systematically or in sequence or serially many teaching material like models, charts, photographs, maps, specimens, three dimensional exhibits and other materials concerned to one definite agricultural subject in pre-decided place and time for a specific period.

OBJECTIVES

1. Creating awareness, interest and desire among farmers to adopt improved practices.
2. To introduce effectively the programmes of agricultural extension activities with different types of farmers.

ADVANTAGES

1. It helps in providing information to large number of people.
2. It helps to create more interest and induces to take action, because of different combinations of materials.
3. It provides information about agricultural research progress.

4. It provides an opportunity to extension agency to locate the interested farmers for different aids and combinations in an attractive and interesting manner.
5. It gives an opportunity for different agriculture agencies to combine together in organizing exhibition.

FARMERS FAIR / KRISHI MELA

Krishi mela is a fair organized by an agricultural institution to transfer new farm technologies through participation of several farmers on the campus by different means.

PURPOSE

1. To provide opportunities for the farmers to know and understand the new technologies developed and being developed on the campus.
2. To help the farmers to learn new technologies by providing contrived experiences through method demonstration.
3. To expose farmers to different sources of agricultural support such as seed firms, fertilizer firms, implement firms etc.
4. To hold the interest and recognize farmers talent by holding competitions for different activities.
5. To provide dialogue between farmers and the research staff.
6. To help researchers to set the problem based on feedback from the farmers.

ADVANTAGES

1. It helps to transfer farm information to a large number of farmers.
2. There is possibility of greater interaction between farmers and the scientists.
3. The methods followed in a research station could be shown on the field.
4. Provides an opportunity for skill improvement.
5. It encourages healthy competition among people.
6. It brings to focus some local innovations.
7. It is a means for the supply of inputs and seed material for the farmers.
8. Helps scientists to meet farmers and to know the field problems.

LIMITATIONS

1. It involves expenditure on the part of farmers.
2. The time may not be very convenient to all.

FARMERS TRAINING

This is an effective learning situation which provide knowledge and skills by contrived means and by other methods to the interested farmers at their convenient time

and place under the guidance of experts. Recently greater importance is being given to farmers training because revolutionary changes have taken place in agricultural sciences. In this context, it is essential to give more importance to farmers training. In this situation farmers should accept completely many changes at a time to use the fruits of agricultural research effectively. Farmers training is one of the special extension teaching method to develop the farmers individually for change.

The fast changing agricultural technology calls for continuous and constant vigil on the part of the learner to step up the farm production. The developing agricultural technology can be efficiently exploited only when a series of related skills are internalized by the learner consequently fitting the same into habit pattern. This can be achieved essentially through the training situation; and hence in most of the developing countries this has been accepted as the major plank of TOT strategy. Training is primarily concerned with the preparing of the participants for certain lines of action which are delineated to technology or in other words to help the participants to improve his performance on his job. Though training is learning and is the means of education, it has got its own characteristics. The main focus in training is on skills for action. The training seeks the internalization of skills in the participants. The trainees/ farmers get the opportunity to practice the new skills in situation resembling the complexities or real life.

MAIN OBJECTIVES

- 1) It helps for internalization of complicated skills in modern agriculture.
- 2) Providing training for farmers to develop leadership which is necessary for acceptance of modern agricultural practices by majority of people.
- 3) Providing continuous educational situation for acceptance of new research findings for development of agriculture
- 4) To develop desirable attitudes
- 5) To induce durable changes

ADVANTAGES

1. Training can be provided to farmers on many aspects.
2. Training can utilize experiences of different teachers.
3. Participant trainee during off period of training, can visit different divisions of training institution and can gather more information.
4. Training provides an opportunity to teacher to utilize different teaching methods into combinations of methods.
5. Training helps farmers to internalize the new methods without mistake.
6. Provides scope for follow-up communication between trainer and trainees.

DISADVANTAGES

1. It is very difficult for participant farmers to spare time.
2. Training requires more time and relatively expensive.
3. Decision making farmers may not participate in training programme in adequate number.

'If you want to plan for a year – Sow the seed

'If you want to plan for future -Plant the tree

'If you want to plan for life – Train the people

OFFICE CALL

It is call made by a farmer or a group of farmers on the extension worker at his office. It is not quite common method in our country. However, it can now be used in many progressive areas. Office call is most appropriate when clients are motivated. It is very economic on time and resources of extension workers.

An office call is one of the personal interview teaching method, in which farmers usually go to the Extension workers' office for seeking a definite assistance of information about specific problem or information on improved agricultural practices.

MAIN OBJECTIVES

1. To help keep closer contact between farmers and extension worker.
2. To help to develop personal and social interest.
3. To help to discuss the problems in detail
4. To help to develop relationship with local organizations and institutions.

ADVANTAGES

1. Farmer will be satisfied by frequent visits to the office.
2. Farmer will be highly receptive to learning
3. Economical use of extension worker's time.
4. It will create better atmosphere for conducting other TOT methods.

LIMITATIONS

1. Contacting the farmers away from the real situation may not help to visualize the real problems.
2. It is rather difficult for the extension worker to stay in head quarters always.
3. The farmers may be dissatisfied with the information they get from the office in his absence.
4. It is difficult for the farmers to make a trip to the office during busy farm work periods.

FARM AND HOME VISIT

This is a method of direct face to face contact between farmers and extension workers at farmer's farm or home.

This method is specially suited to build acquaintance with farmers and gain understanding of the problems. It is helpful to share information and teaching skills. The method brings quick results in traditional areas where farmers had not been exposed to new technologies so far. Extension worker contacts the farmer or members of the family on his farm or at his home with specific objectives either at the request of the farmer to promote a new programme or to introduce an innovation.

MAIN OBJECTIVES

Main objectives of this method are as follows:

- a) To get acquainted with farmer and gain his confidence
- b) To discuss individual or local problems
- c) To give information to farmer regarding improved practices relevant to his condition
- d) To teach new skills to farmers.

ADVANTAGES :

1. First hand knowledge of rural problem gained.
2. Mutual interest between farmer and extension worker gets developed.
3. Extension worker develops confidence when his recommendation are adopted more and more.
4. It helps to identify the local leaders.
5. Members not reached by other methods are contacted.
6. %age of adoption to advocations rendered is high.

LIMITATIONS

1. Number of contacts possible is limited.
2. Contacts suited to both the farmer and the extension worker are limited.
3. Frequent visit to the responsive or progressive farmers might prejudice other farmers against the extension worker.
4. Comparatively it is costly.

"Word-or-mouth instruction is the oldest form of education".

CROP CAMPAIGN

It is an intensive teaching activity under taken at an opportune time for a brief period focusing attention in a concerted manner on a particular problem with a view to stimulate the widest possible interest in a community, block or other geographical area. Campaigns are launched only after a recommended practice has been found acceptable to the people as a result of other extension methods like method or result demonstrations.

MAIN OBJECTIVES

1. To provide solutions to a strong prevailing problem and motivate farmers into action quickly
2. To coordinate the efforts of different agencies and individuals in solving specific problems

ADVANTAGES

1. This method benefits large number of people.
2. It paves the way for acceptance of new idea quickly.
3. Acceptance of new methods by individual farmers at low cost.
4. It creates stronger confidence in farmer towards extension activities where campaign is in operation.
5. It provides the working ground for coordination of efforts of many agencies, individuals and organizations etc.

LIMITATIONS

1. It is difficult to have cooperation between the extension workers and other different organization.
2. Its use is limited if the solutions for problems are complicated or difficult.
3. Use of this method is limited to few topics only.

VIDEO FILMS / MOVIES

Movie is one of the special TOT methods. It helps to provide recreation and information or knowledge in easily understandable way. Farmers believe and remember for longer period the information provided through this media, for the simple reason that it involved two senses. The peculiarity of movie film is that transparent still pictures are jointed together serially and projecting the same on the screen at determinate rate. A principal of human vision sight known as "persistence of vision" is exploited to bring about the motion in the movie films. For displaying picture, projector and screen are absolutely essential.

MAIN OBJECTIVES

1. To create awareness about definite extension activities and including farmers to accept the improved practices.
2. To use in general meeting, to increase the perception of farmers about the innovations.
3. To teach step-by-step procedure.

ADVANTAGES

1. By this method movement of objects or material can be shown.
2. It helps illiterate people to gain the knowledge.
3. The actual incident can be shot or dubbed, can be preserved for longer period and can be used according to situation.

4. Shooting the actual incidents in different distance and places can be exhibited locally.
5. Spread of the film may be increased or reduced as and when required
6. Many visual aids can be internalized in film effectively
7. In short duration more information can be provided to larger number of people.

TELEVISION

Television is the magic media of TOT methods which provide information through live situation to large number of farmers, catering to heterogeneous audience by involving the senses of seeing and hearing. Here many projected aids, specimens, models, graphs, and charts are used. It is a distinctive mass education method and its use is of recent origin in rural extension activities. Broadly speaking television is a means of converting a scene into an electronic image which is sent through space and picked upon a suitable television screen for the viewer to see the same as a duplicate of the original scene.

OBJECTIVES

1. To provide desired information by utilizing live situations.
2. To broadcast quickly the urgent information in a convincing manner.
3. To provide opportunity for learning in a sequence.

USE

1. Different situations may be used in television programme.
2. Information may be provided through television to farmers by utilizing extension methods like meetings, method demonstrations etc.
3. Many projected aids can be utilized.
4. Training can be given through this method.
5. Educating people through recreation.
6. Audience gets confidence in television programmes because they can see and hear simultaneously.
7. Past situation may be revised.
8. Amicable to many subject matter.
9. Can provide recognition.
10. Useful to both literate and illiterates.
11. They can be effectively reached.
12. Serve as reminder.

RADIO

Radio is one of the fastest audio-media through which message can be communicated to large number of people

very quickly in short period. Generally the main objective of radio is to educate people, to provide recreation and broadcast news etc.. In recent days radio is playing important role in agricultural extension activities. Radio provides urgent information in time.

OBJECTIVES

1. To condition the farmers to accept improved practices.
2. To provide urgent information speedily and in time.
3. To provide every day agricultural information to farmers in definite time/ in fixed time.

ADVANTAGES

1. Urgent information can be communicated to large number of people in short period.
2. Listeners can listen to the programme at any place.
3. Information can reach for both literate and illiterate farmers.
4. Broadcasting the experience of progressive farmers of agriculture, which may create confidence in other farmers to accept improved agricultural practices.
5. Listeners can listen extension programme through radio at any time and in any place.
6. Information can be provided to farm families as well as illiterate people.
7. Broadcasting the experiences of important persons of agricultural sciences may create confidence in other farmers to accept improved practices.
8. Radio provides recognition for the concerned farmers as well as scientists. Radio programme forms effective forum to bring together or in sequence the required information to all concerned dealers, farmers, bankers, specialists, development agencies and representatives.
9. In short, radio can motivate, stimulate, sell and induce belief, create and change basic attitudes and it can do so in a hurry.

LIMITATIONS

1. It is costly method as compared to other teaching methods
2. Information can be listened only once, cannot be listened frequently as and when desired.
3. Here, learning takes place by hearing only
4. Extension worker cannot arrange radio programmes as and when he desires
5. It is difficult to measure the effectiveness of radio programmes
6. Distortion of message due to unfavourable weather is not uncommon.

Radio and TV have vastly increased their reach. "Local" radio and new FM transmitters open up possibilities of area-specific broadcasts. In communicating with an audience with low literacy skills, an audio-visual medium like TV has advantages. Much wider and creative use of the mass media – All India Radio, private FM, Doordarshan, private cable network are being promoted for more rapid and effective dissemination of general information and advice to farming communities. This may include market information, market led production planning, on farm and post harvest management/value addition, e-contracting, market networks, market intelligence and wider application of World Wide Web.

COMPUTER

The computer is one of the powerful devices for storing and processing information. Widespread use of computers had helped to develop several computer based devices and techniques. Word processors and laser printers are increasingly being used in communication centers, printing houses, for printing agricultural extension publication, reports, newsletter etc. With the help of mini computers it is possible to have graphic illustrations prepared which facilitate comprehension of extension publications.

Computers via satellites can take pictures of clouds to accurately forecast weather conditions and with remote sensing techniques can accurately work out land use, area under forests and the like. With the help of fax-machines, message, including illustrations, can be transmitted from one place to another easily. Thus, all such devices and other in the pipeline, have a great potential in agricultural communitarian.

CIRCULAR LETTERS

Circular letter is a letter which is sent to farmers on special occasion. Circular letter consisting of the same or common subject matter and addressed personally to the learner concerned.

OBJECTIVES

1. Circular letter creates interest in farmers and inspire psychologically to participate in extension activities.
2. It helps to keep continuous contact with farmers.

ADVANTAGES

1. Circular letter can be sent in special occasion to the concerned farmers stating solution or remedial measures to current problems.
2. Can reach to large number of literate farmers
3. Comparatively cheap
4. Can be used to maintain the tempo of work
5. Can be used to boost the prestige of local leaders
6. Can act as a reminder

LIMITATION

1. It is of little use in areas of low literacy

FARM PUBLICATIONS

Periodicals and Magazines: Such publications are of immense importance in dissemination of know-how. Many such periodicals provide information supplemented with data. There are exclusive farm periodicals like Indian farming, Kheti and Parliament, Shri Sugi, Shetkari, Kisan Shakti, Baliraja.

Books and Booklets: This publication cater to the need of farmers.

Leaflets, Folders, Handouts, Pamphlets and Bulletins: These are most convenient means of providing scientific know how.

Newsletters: These are aimed reminding people in time to intimate immediate action. Newsletters should have : (i) appropriate caption (ii) interesting, attractive and provoking introductory paragraph (iii) it should state the importance of problem (iv) it should be well timed and written in simple and effective language.

Handbills: It is a one sheet material used for popularizing a new product, practice or idea.

Wall-newspapers: They are big sheets of papers with current news, experiences, recommendations printed on them for being pasted on wall which invite attention of viewers for reading. Farmers like to read writings that is recent, relevant, reliable and readable.

Newspapers: Although a newspaper primarily provides news, views and advertisement, yet extension articles meant for farmers and success stories do find place. The characteristics of such write up should be: (i) simple, easily understandable, short sentences with photographs, (ii) well illustrated.

**FARMERS' EDUCATIONAL TOUR/
FARMERS' EXPOSURE VISITS**

In this method the extension worker takes farmers as per planned programme to demonstrations, research centers during limited short time. It is necessary to distinguish educational tour from the field trips of the farmers. Field trips are designed to take a group of farmers to another farmer's field where he has successfully exploited the new technique or practice.

MAIN OBJECTIVES

1. It provides an opportunity for farmers to see fresh agriculture research findings.
2. It provides an opportunity for farmers to know the agricultural practices in different areas.
3. It helps people to recognize problems, to create interest, to generate discussion and to provide action.

4. It provides an opportunity for understanding the successful use of the modern agricultural practice by farmers of different locations.

ADVANTAGES

1. Participants can know the experiences of other region farmers and accept the new ideas.
2. Develops the farm leadership.
3. It provides an opportunity for comparing the new practices.
4. It helps researchers for finding problems of farmers.
5. It promotes better understanding between farmers and extension workers.
6. Farmers will get detailed information at many places and many times on a improved practice.
7. Widens the vision of participants.

LIMITATIONS

1. It is costly method.
2. It is difficult to arrange tour programme which is suitable for all the farmers and others concerned.
3. Sometimes it is not possible to get accommodation and transport facilities.
4. Its effectiveness will be reduced if other interest overlap the educational purpose of tour.
5. If badly conducted, it would create frustration and may hamper other educational programmes.

MEDIA FORUMS

A combination of mass media and interpersonal channels is perhaps, the most effective way of reaching people with new ideas and persuading them to utilize the innovations. For this purpose media forums can be developed and used. Media forums are organized small groups of individuals who meet regularly to receive a mass media programme and to discuss its contents. The mass media linked to the forum may be radio, radiophonics, television, video etc.

**SELECTION OF TRANSFER OF
TECHNOLOGY METHODS**

Generally thousands of farm families constitute the clientele system of an extension worker. Extension worker is expected to select different TOT methods and use them in appropriate combinations in different situations to cater to the varied needs of the farm information. There is not a best TOT method which can suit all the situations in extension worker's operational area.

There are some major points to be remembered while selecting TOT methods and using in appropriate combination. These are: Main Objectives of educational

programme, Nature of clientele system, Number of students, Steps in Adoption Process, Subject matter content, Extension Teacher, Availability of materials while using extension teaching methods, Cost of teaching methods and Adopter categories of farmers.

COMBINATION OF TOT METHODS

The objective of TOT/ extension programme is of bringing about intended changes in the clientele system, which cannot be achieved by any single educational method. To activate the fundamental objectives of the extension programme, it is necessary to use TOT methods fruitfully and in different combinations.

Following points to be remembered by extension worker to use TOT methods in combinations effectively.

I. NATURE OF THE IMPROVED PRACTICE AND COMBINATION OF TOT METHODS.

Combinations of TOT methods depend upon nature of improved practice.

Ex. 1: If improved practice is concerned to learning of skills only (raised seed bed, use of improved agricultural machines etc.) then series of lectures, method demonstration and visual aids can be used in combination to make education fruitful.

Ex. 2: If the learners are to be convinced regarding comparison of improved practice with old practice, then discussion meetings, farm and home visits, method demonstration, result demonstration, field days, farmers days, etc. can be used in combinations.

II STAGES IN ACCEPTANCE OF IMPROVED PRACTICES AND COMBINATIONS OF TOT METHODS.

Research studies have conclusively proved that there are 5 stages in acceptance of improved practices by farmers. It is an individual decision making process. The stages are :-

Awareness, ii) Interest, iii) Evaluation, iv) Trail adoption, v) Adoption or Rejection.

The extension worker should use the TOT methods in appropriate combination at different stages of adoption to get the desired outcome.

III. INTELLIGENCE AND TRAINING OF EXTENSION WORKER

Appropriate combination of TOT methods also depends upon extension workers' intelligence and training.

IV. FORMULA OF TOT METHODS COMBINATIONS

It is difficult to inspire people to accept any new ideas and changes without the use of many TOT methods. As the extension worker learns new methods and techniques, he may have to include them in suitable combinations. For use of some important TOT methods in rural area of

India according to current situation, the extension worker can follow the following limited combinations formula as follows. This is an exhaustive list of combination. This is an exhaustive list of combination. This can act as a guideline.

I. RESULT DEMONSTRATION

- A. Discussion meetings
 - i) Use of visual aids,
 - ii) Distribution of printed matters
- B. Personal visit
- C. Starting of demonstration
 - i) Method demonstrations
 - ii) Field visits
- D. Field days
- E. Farmers' days.
- F. Film show
- G. Publishing through line charts, printed matter, newspaper, radio with help of results of demonstration.

II METHODS DEMONSTRATION:

- A. Lecture
- B. Visual aids
- C. Training to learn skills
- D. Hand outs
- E. Revisits to Farms and Homes

III CAMPAIGN

- A. Newspaper
- B. Radio
- C. Posters
- D. Banners
- E. General Meetings
- F. Discussion Meeting
- G. Method Demonstration
- H. Hand outs
- I. Block Demonstrations

SUMMARY

As experienced from the results of wheat Front Line Demonstrations (FLDs), Result Demonstration have been found to be an important, effective and efficient method of TOT for increasing wheat production. The other important methods are : Extension Talk, Case Studies, Skill Teaching, Method Demonstration, Field Days, Exhibitions, Farmers Fair/Kisan Mela, Video Film Show, TV, Radio, Computer, Farm Publications etc.

Extension workers' main job is to educate the village people. Extension methods are the tools of the extension workers. These tools are called TOT or extension teaching methods, to create situations in which communication can take place between the extension worker and learner.

Effectiveness of the TOT methods depends on the combination of the same. Research studies have conclusively shown that the adoption of innovation is positively related to the combinations of different TOT methods, at different stages of learning.

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