



INDIA:

Background of the study

The IPCC Report was released on 28th February, 2022. It has predicted that Temperature will increase further by 1.5°C, Sea level will rise, Heat wave will increase, Moisture level in air will increase etc. This is where climatic adaption becomes critical. While mitigation involves cutting the pace of global emissions and slowing down warming, adaptation is essential to save lives and livelihoods in the short to medium term. Adaptation also helps in building long-term resilience to impacts of climate change. If farmers will not adapting to changes in crop practices this will cause crop failure / low production. Already in Gujarat crop productivity is on decline. Therefore, it is, necessary to have improved Climate Resistant Practices to be identified and transferred to farmers. We need to develop improved climate resilient practices and climate related services and work with farmers; therefore this project is developed and we selected about 600 farmers with the help of Aatapi Foundation, Shroff Foundation Trust (SFT), VRTI Bhavnagar and VRTI Naliya. For complementary work we need to work from ground level like, with farmers to agriculture

Universities -Government departments for implementation; Work through them we can develop action research plan. Each of this 4 organization has KVKs in nearby and that will be very useful for this project. After assessing our efforts and its adaptation we can jointly prepare a plan to developed general guidelines and help to increase farmer's income and making a climate smart farmer. Climate change can reduce agricultural income by 15-25 per cent; it is high time that rationale of climate-resilient agriculture (CRA) is valued and implemented more rigorously.

- Adaptation of appropriate mitigation technologies such as the cultivation of tolerant breeds to overcome the climate stress
- Water and nutrient management for efficient productivity and resource Utilization.
- Agro-advisories for timely crop monitoring.
- Conservation agricultural practices to build soil organic carbon and to build congenial environment for plant growth, manure management.

Increasing population, increasing average income and globalization effects in India will

increase demand for quantity, quality and nutritious food, and variety of food. Therefore, pressure on decreasing available cultivable land to produce more quantity, variety and quality of food will keep on increasing.

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IMPACT OF FARMERS' TRAINING PROGRAMME

NCCSD has organized farmers training programme especially on Climate change its effect on Agriculture and to overcome from this issues. The training programme has definite objectives as given below the training is given to the farmers to achieve set objectives.

1. To develop Common perception about- Climate change its basic concept how it has been developed.
2. To increase knowledge of Cultivation practices of main crop related to climate change.
3. To train the farmers to work as local leaders in their villages for climate change issues.
4. The main idea behind this investigation Survey was to observe the impact of training on farmer who was trained at the different centre. This training Centre has their own objectives. It was therefore thought to know as to what exact the training has helped farmer to understand the basic concept of climate change and to adopt Climate change Oriented Improved practices: to play leadership role. This study was to know farmers present state of mind about climate change.

Methodology

The study is conducted in four major districts i.e. Amreli, Kutch, Bharuch and Chhota udepur of Gujarat state. This kind of projects included different actors from top level to the bottom level.

The data were collected from the cultivators who were trained from different four KVKS and Voluntary Organization. An interview schedule was considered as an appropriate tool for gathering information from the selected farmers involved in climate smart agriculture. The data collected from the farmers responds were tabulated and it has been analyzed and described in terms of percentage.

All farmers were trained by different 4 districts KVKS and voluntary organization, out of 601 total farmers 100 farmers were selected randomly and trained further. Following training

would have been conducted by all different organizations and further supervised by agriculture university experts.

Result and Discussion

Personal Characteristics

The following personal characteristics of the farmer who had attended short term training were studied.

1. Age
2. Level of personal education
3. Size of land holding;
4. Source of Motivation
5. Purpose of attending Training
6. Usefulness of training etc.

The total number of farmer who had joined the training classes at the training centre was one hundred (100). Various categories of the above characteristics have been discussed with them.

Age

The represents were asked about their age to know from which age group's majority of our farmers had joined the training classes organized by the training centre. The information about the age of represents is present in Table-1.

SrNo	Item	Number of Response out of 100	Percent (%)
1	Below 30	20	20
2	From 30 to 50	66	66
3	Above 50	14	14

From this above data it can be seen that majority of the trained farmer (66%) were found to be in the age group of 30 to 50 years; while 20% of the trained farmers were in the age group of below 30 years. Farmers who had crossed 50 years were 14%. Majority of the farmers were from the age 30 to 50 means most of the farmers are middle age farmers and that is the good point because they have some past experience and there is a chances to adopt new technology in this group. They will willingly ready to adopt new technology because of they will easily connect to technology also.

Level of Education

Education level of farmers is supposed to play a pivot role in understandings of new innovations and climate change. The data collected from the representative about numbers of farmers of schooling completed are present in Table-2

Sr. No	Item	Number of Response out of 100	Percent (%)
1	Illiterate	12	12
2	Able to read & write	23	23
3	Primary Education	32	32

4	Secondary Education	22	22
5	Graduate	01	01
6	Post Graduate	02	02

The represents were divided in to six categories according to level of education. More number of farmers was found to have (32%) primary level. One represent were found to be graduate level while two trained farmers were post graduate. Same way more number of the farmers was found to have education up to S.S.C examination (22%).Twelve represents were found to be illiterate while twenty three farmers were able to read and write. The level of education suggest training , all kind of demonstration and all kind of discussion could done in their local language will help them to understand the process.

Size of Land holding

Sr. No	Item	Number of Response out of 100	Percent (%)
1	Below 1 Acre	2	2
2	Between 1 to 3 Acre	42	42
3	3 to 5 Hector	24	24
4	Above 5 Hector	32	32

The result shows that 42% of the farmers from the total representatives are having 1 to 3 Acre land holding. 32% of the total farmers are having more than 5 hector land holding; 24% farmers are having 3 to 5 hector land holding. As per Indian agriculture concern Small farmers are in highest number means to bring new technologies and practices to such a large number of smallholders scattered over a vast countryside and integrating them with the modern input and output markets is a huge challenge for Indian agriculture.

Source of Motivation

Different source are there to motivated farmers to join training classes. It was thought to know the different types and numbers of sources which motivated the farmers to join the training. The farmers were asked to indicate the source by which they were motivated towards

this training is present in Table - (4a) and numbers of motivational sources are present in Table - (4b)

Table -4a

Sr. No	Item	Number of Response	Percent (%)
1	Farmer himself	4	4
2	Relatives	1	1
3	Family member	2	2
4	Other trained farmer	0	0
5	Village level worker	1	1
6	Staff member of KVKs	12	12
7	Service organization	98	98
8	others	4	4
9	Agriculture University	0	0

Table -4b

Sr. No	Item	Number of Response	Percent (%)
1	one	80	80
2	Two	20	20

From this data it was found that not a single farmer was trained from Agri-universities and other farmers as well. The village level worker was indicated as a source of motivation by one percent. The service provider organizations were indicated as a source of motivation by 98%. Krishi vighyan Kendra were stood second (12%) in rank as source of motivations; while four farmers had added themselves to join the training classes. The percentage of the respondents who has reported their relatives and a member of their family as a motivated source is 1 % and 2% respectively. Four respondents had indicated that they were motivated others source of motivation.

Number of sources which motivated the farmers to take training

Majority of the trained farmers (80%) had reported only one source which motivates them to take part in training. Two sources of motivations were reported by 20%. Thus one source was found enough to motivate majority of the farmers to take training.

Purpose of joining training

This training has its definite objectives. Keeping these objectives in view the training is given to the farmers. Similarly the farmers join the training class with some definite purpose. This purpose may be different in groups of farmers; so it was thought necessary to us to which type and with many purpose farmer joined institutional climate change training classes. The findings have been given in the table - 5 (a) and Table - 5 (b)

Sr. No	Item	Number of Response	Percent (%)
1	One	56	56
2	Two	72	72

The data regarding purpose of taking training is indicate that the majority of the trained farmers i.e. 72% had indicated that- they took training for improving their farming by learning cultivation practices of climate smart agriculture. The number of farmers who had joined the training classes to acquire climate smart agriculture was found to be 68 %. While 27% farmers come to attend this training for developing new relations with some other farmers; similarly 2% of those farmers found to come to get stipend. This data is clearly shows that farmer is ready to learn new techniques.

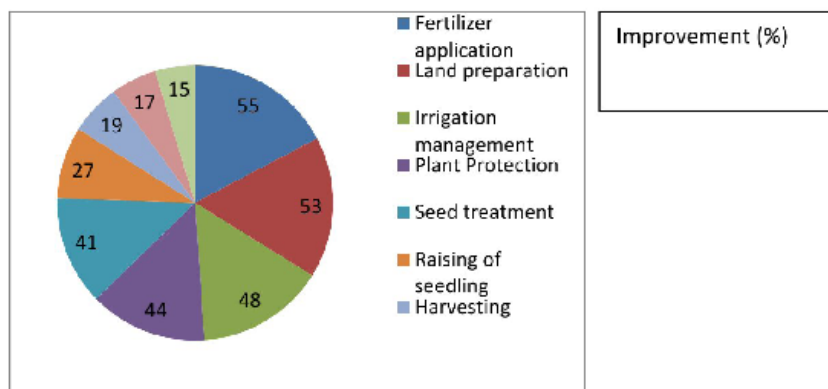
Number of purpose for joining training classes

Majority of the trained farmer (72%) represent that they joined training for two purpose. while the percentage of the respondents who joined training classes with a single purpose was 56%.

Improvement after training

Improvements made in various cultivation practices after training it was thought to know who among them have changes their practices of farming. In all 9 cultivation practices were listed in the interview schedule. The respondents were asked to indicate in which cultivation practices he made change after these trainings. Distributions of farmers practices after taking training is given in table no-6

Sr. No	Item	Number of Response	Percent (%)
1	Land preparation	53	53
2	Raising of seedling	27	27
3	Seed treatment	41	41
4	Fertilizer application	55	55
5	Irrigation management	48	48
6	Plant Protection	44	44
7	Weed Management	17	17
8	Harvesting	19	19
9	Storage	15	15



From the data collected it was found that 17% respondent had applied weedicide; Majority of the trained farmers 55% had made improvement in fertilizer managements. I.e. Change in the methods of application, change doses of fertilizer. The percentage of the farmers who started to give seed treatment before sowing is 41% while 44% farmers had made change in their plant protection method. Change in harvesting, storing and irrigation practices was 19%, 15% and 44% respectively; In these some of the farmers changes more than one techniques also.

The categories represent changes in farm production practices, changes in the land use, water management practices, changing land topography to address moisture deficiencies and change in timing of farming

activities. From FGDs, the adoption of CSA practices is explicitly done to increase agricultural productivity and increase resilience to climate variability and change.

Usefulness of training programme

The distribution of trained farmers according to this option about usefulness of training in increasing interest in farming and farm production has been given in Table -7

Sr. No	Item	Number of Response	Percent (%)
1	Increase in Farming	55	55
2	Increase in farm production	63	63

Majority of the trained farmer had opinion that the training had helped them in increasing in farming and farm production 55% & 63% respectively under the situation of climate change. The need of taking farming by the farmers was reported by many farmers. Thus importance of taking training was realized by most of the trainees.

A large number of trained farmers had made improvement in their cultivation practices. I.e. application of fertilizer, land preparation, irrigation method, seed treatment etc. With adoption of these many changes farmer will play a role as leader.

Summary

Majority of the trained farmers were found to be in middle age group with primary education. Same way most of the farmers possess small and medium size of land holding. The trained farmers were motivated by one source of motivation. Majority of the trained farmers had come with two purposes specially to get knowledge of climate change and to improve their farming. Majority of the trained farmers had adopted recommended agriculture new practices related to climate change situation. Same way most of the trained farmers had played leadership role in their village for developing common perception regarding climate change and its effect on agriculture. Most of the trained

farmers say this climate change related training found to be useful for them as increase farm income.

Conclusion

In this stage we can make a few conclusions from this study.

- First, the adoption of CSA is affected by farmers' perception of climate variability and change at the farm level.
- The adoption of CSA is also influenced by farmers' attitudes and knowledge of climate change.
- Education and access to information are essential for farmers to perceive climate change accurately.

Results shows farmers' perceptions are significantly influenced by the farmers' level of education, access to weather and climate information, and access to agriculture extension services. Farmers' agricultural activities adjust to their climate perceptions. Smallholder farmers adopted crop diversification, change of planting time, crop rotation/mixed cropping, use of manure and change of crop varieties as the major adaptation strategies. They explicitly adopted the practices to enhance their resilience against climate variability and change.

To increase the effectiveness and sustainability of adaptation interventions in the study area, we recommend climate change knowledge and adaptation capacity of farmers is part of the local development agenda. Local governments need to prioritize climate change awareness and allocate sufficient resources towards the same cause. Such actions can go a long way in enhancing awareness and promote informed climate change adaptation actions.

National and Country governments need to incorporate the climate change knowledge of the people and shape farmers' understanding of climate change. Having useful linkages between farmers and relevant stakeholders (e.g., researchers, extension office and meteorologists) strengthened is one way of improving and synchronizing farmer knowledge with their farming activities.

Further research: Action plan for Second year2023-2024

- Study should be repeated with more respondents so that long term impact of trailing can be known by applying suitable and appropriate statistical state.
- Regular training with KVK follow up programme should be prepared and maintained by the farmers.
- Separate study for determining the reason for not applying recommended technology.

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