# COMMUNICATING CLIMATE FORECAST TO FARMERS THOUGH CLIMATE FIELD SCHOOL: INDONESIAN EXPERIENCE

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## 1. Introduction

Agriculture activities are very depending on climate condition. The failure of crops to produce good yield is very often due to bad climate. Capability of farmers to use climate forecast to anticipate the events is very limited. On the other hand, climate forecast information issued by Meteorology Bureau is not informative due to low level of understanding of the users (local authorities, extension workers, and farmers) to the terminology used and also their ability to use climate (forecast) information for supporting farming activities. In many cases the end users will seek the information and use it when it will give benefit. Therefore, developing effective method for communicating climate (forecast) information to the end-users is important.

Transferring knowledge of climate to farmers may require time. The involvement of intermediaries in the process is very important. How climate information should be translated into farmer language is one of the most important aspects that need to be developed. The extension workers who are the main mediator for transferring new technology to farmers should be trained. Learning by doing process may be an effective process for transferring climate knowledge or climate information to farmers. In this regards, the process is called as Climate Field School (CFS).

The field climate school is intended for (i) increasing farmers knowledge on climate and ability to anticipate extreme climate events for their farming activities; (ii) assisting farmers in observing climatic parameters and their used for supporting their farming activities, and (iii) assisting farmers how to translate the climate (forecast) information for supporting farming activities, in particular planting decision and cropping strategy.

## 2. Climate Field School

### *2.1. Concept of Climate Field School*

Concept of Climate Field School is adopted from Farmer Field School designed for Integrated Pest Management. In this case, the process for the dissemination of climate information to farmers should follow the process of introducing new technology. Farmers should be convinced from their own experiences that the use of climate forecast information would increase their benefit and the resilience of their system to the extreme climate events.

The forms of CFS activities are simulation process and interactive discussion between field facilitator and farmers regarding climate, and group dynamic. In addition to that before the simulation process, the farmers conduct field observation regarding crop performance in their field, type of pest and diseases found in their crops, and measurement of soil moisture, relative humidity and air temperature. During the meeting their findings in the field can be discussed among their group and facilitated by the field facilitators. Whenever necessary, a special topic during the meeting can also be given, such as an important issue that should be responded by farmers. For example, how farmers should respond to the climate forecast recently issued by the Meteorology Bureau for a particular season, or participating in special program offered by government etc.

CFS program consist of two phases. The first is *phase of socialization*, that is a phase for CFS socialization to farmers carried out in eight months or two planting season (24 meetings, 12 meeting in dry season and 12 meeting in wet season). The second is *phase of institutionalization*, that is a phase for implementation or further activities in the form of field actions done by farmers as CFS participants. This phase is carried out after the Socialization Phase for eight or more planting seasons. The phase of socialization is intended to increase farmers' knowledge on climate and the use of climate (forecast) information for designing cropping strategy and the phase of institutionalization is intended to capacitate the farmers on how to practice the knowledge in their farming activities.

In the Climate Field School, all modules will be given in the form of game or simulation. This is intended to expose the participants to the process of learning by doing. In other word, the CFS is a continuous process, i.e. getting experiences from doing, discussing or explaining the experiences to colleagues, analyzing the experience together, taking conclusion, and taking action (implementing) and then get again new experience from the action taken etc (Figure 1).

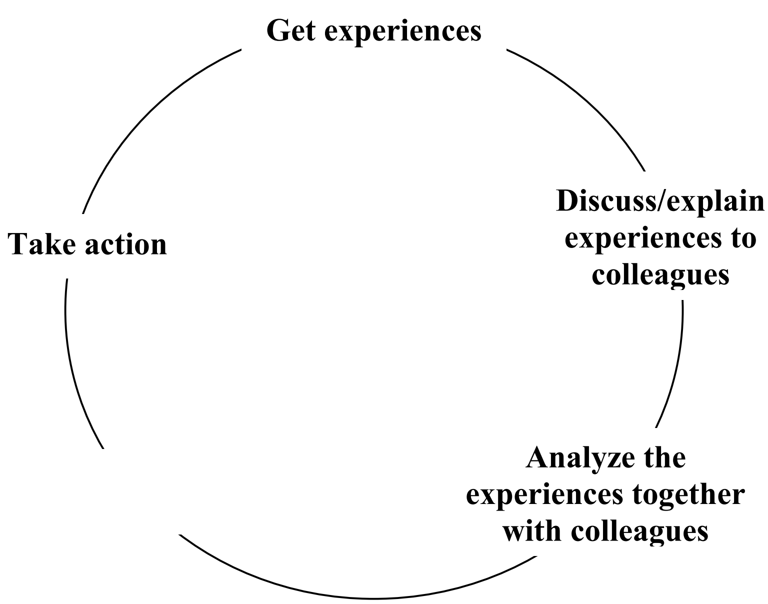


Figure 1. Process of Climate Field School

### *2.2. Methodology*

In the first phase of CFS, a number of agriculture extension specialists (called PL-1 or Field Facilitator 1) were trained about basic of climatology and its application. The materials for the training may cover the following aspects:

- Basic concept of climate prediction (probability concept, terminology used in climate prediction etc.), climate forecast products
- The use of historical agriculture data (drought/flood data, planting data, harvesting data, agriculture production data etc.) to assess the impact of climate variability/extreme events on agriculture, and simple water balance analysis, technology for rain harvesting, etc.
- The use of climate forecast information for setting up cropping strategy (cropping pattern, crop rotation, intercropping etc.)

Based on knowledge gained during the training, the PL-1 along with the trainers will develop CFS modules. The modules are then tested through the simulation process with extension workers who will become field facilitator 2 (PL-2). A number of key modules being developed in the Pilot Project at Indramayu District are presented in Appendix 1.

Before the modules being used in the CFS, the PL1 along with PL2 again conduct simulation on the use of the module among themselves. In addition to the climate modules, modules on non-climatic aspects such as pest management and group dynamic exercises to develop better leadership, creativity, and team works were also included. The process of implementing the first phase of CFS is presented in Figure 2.

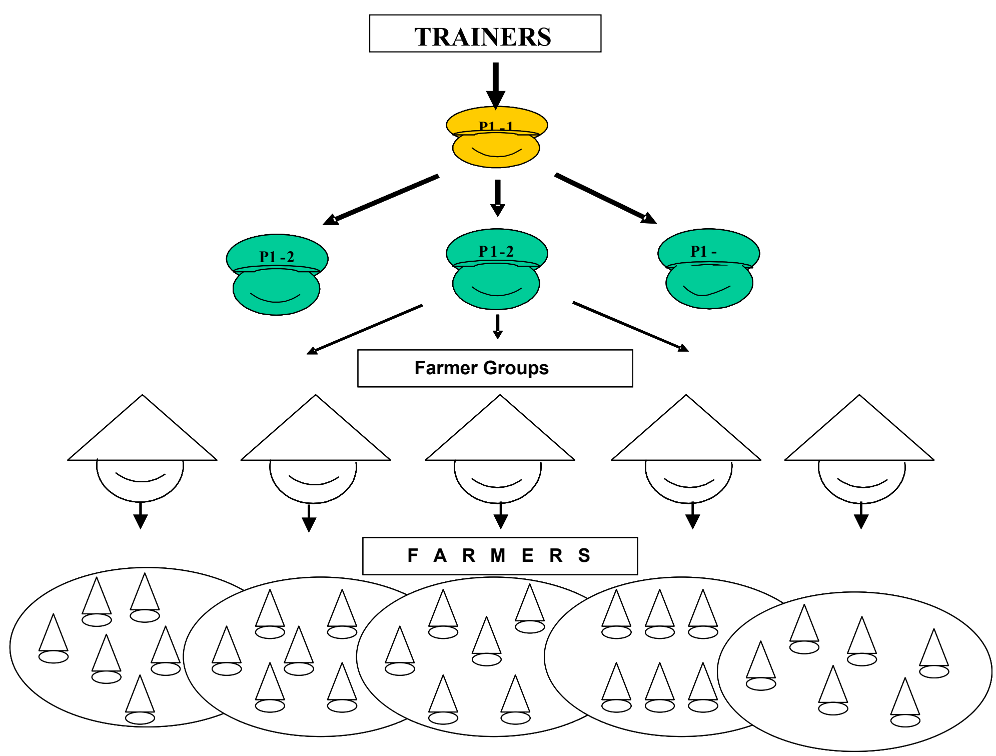


Figure 2. Climate Field School for Phase 1 (2 planting seasons)

Later, in the second phase, more modules will be developed, which will cover many aspect of climate information application. In this phase, the PL1 will become Training Coordinator (called PL-C) at the district under coordination of local government, while the PL2 become PL1, and head of farmer groups become PL2 and some of leading farmers may become sub-farmers leaders for assisting the leader of the farmer group to execute Climate Field School program. In this phase, the CFS is disseminated to other farmers in the region (Figure 3). In summary, the process of the implementation of the CFS and the role of PL1 and PL2 is presented Figure 4.

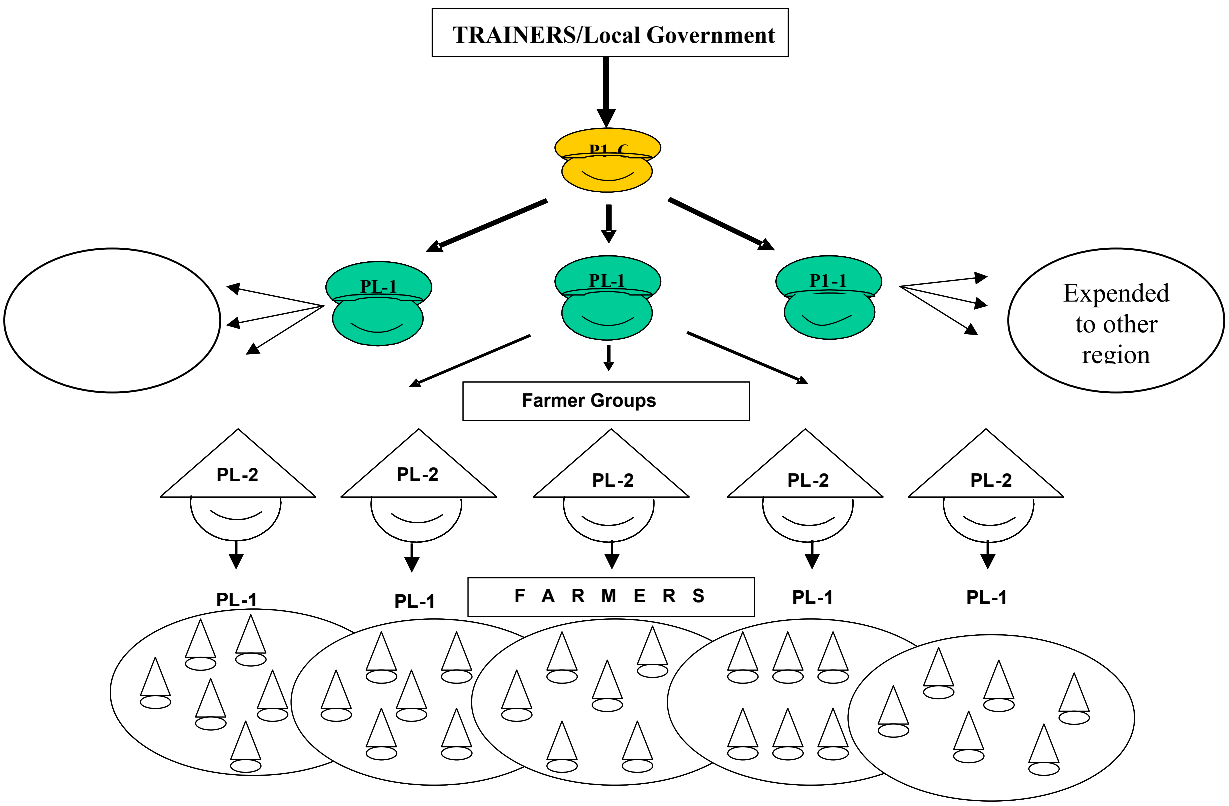


Figure 3. Climate Field School for Phase 2 (8 planting seasons)

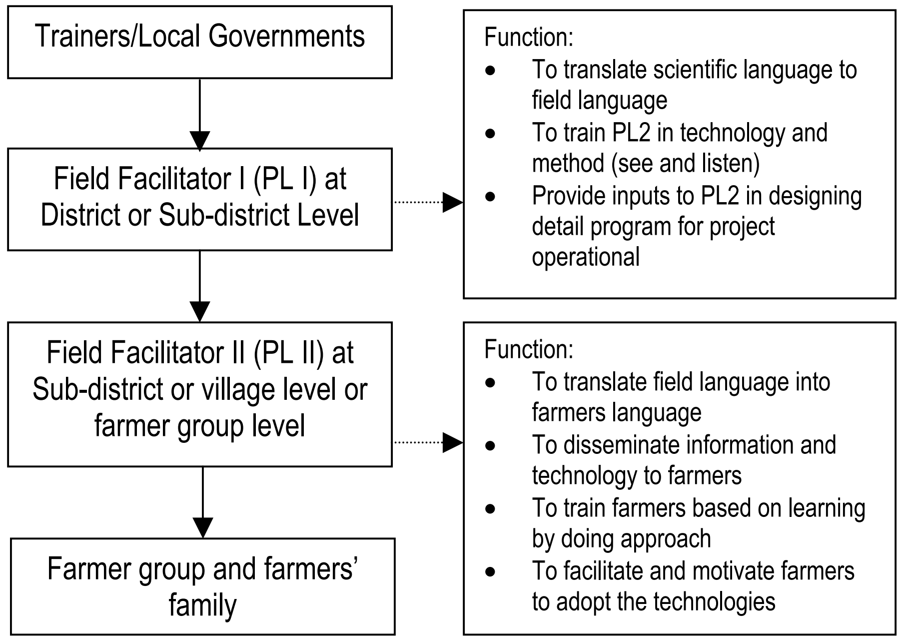


Figure 4. Summary of the process for the implementation of the Climate Field School

### 3. Evaluation

In order to evaluate the success of the CFS program, an evaluation was carried out in the last meeting. The criteria being used for the evaluation were:

1. The presence of participants and the field facilitators
2. Ability of the Field Facilitator to carry out the activities
3. Ways to present the modules and the relevancy of the modules to the farmers' needs
4. Level of participant's understanding towards given modules

From the study case, the CFS approach was found to be effective in communicating climate information to farmers. Most of respondents gave very good response to the program. Most of the participants said that their knowledge on climate has increased. About 70% of the participant gave score equal or more than 7 (scale of 1 to 10, where score 10 is the highest or the ability has improved a lot; Figure 5). Among the ability being assessed, about 70% of the participants considered that their knowledge and understanding on weather/climate, the ability to use observed climatic data and climate forecast information to support their farming activities, and their awareness on the importance of working in a group has increased significantly.

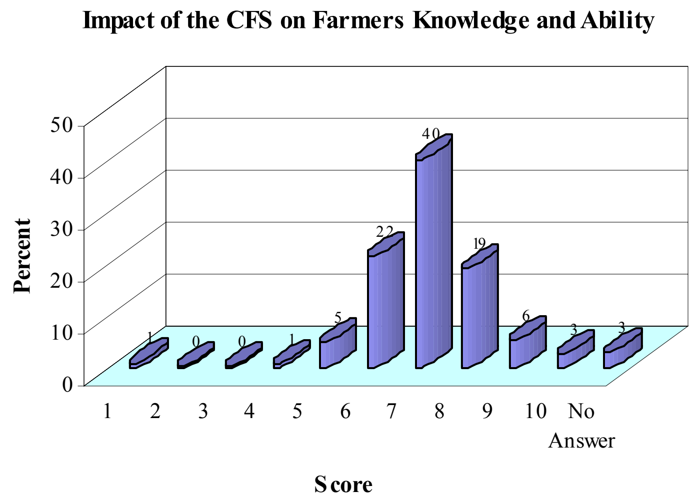


Figure 5. Impact of the climate field School on farmers' knowledge and ability

## 4. Concluding Remark

The CFS approach may also be efficient and effective for communicating the information needed to adapt to climate change. However, the difficult part would be to translate the climate change knowledge into farmers' language (module development) and how to bring their experiences in facing current climate risk to the future actions needed to adapt to climate change.

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## Appendix 1. Key Modules being developed in the First Phase of CFS program at Indramayu District

| | | |
|---|---|---|
| 1. | Knowing about Elements of Weather and Climate | • To introduce element of weather and climate<br>• To Build ability to differentiate between weather and climate |
| 2. | Process of Rain Formation | • To study the process of rainfall formation<br>• To develop better understanding on the importance of forest in retaining water. |
| 3. | Developing Understanding on Terminologies Used in Seasonal Climate Forecast | • To develop capacity to understand the meaning of NORMAL, BELOW NORMAL, and ABOVE NORMAL used by BMG<br>• To develop capacity to translate the seasonal climate forecast used by the BMG to local condition (in their farm) considering the trend in rainfall data measured by the farmers. |
| 4. | Developing Understanding on Probability Concept (Forecast Contains Error | • To develop better understanding of probability concept and skill of forecast in climate forecasting and its relation to decision making. |
| 5. | Introduction To Measuring Tools for Weather/Climate Weather Measurement Equipment and Ways of Calibrating Data | • To introduce instruments used for measuring weather/climate elements<br>• To learn factors affecting the accuracy of data measured by non-standard instrument<br>• To learn how to calibrate data which is not measured using standard method |
| 6. | How to Use Climate Forecast Information for Setting Up Planting Strategies | • To develop better understanding on how climate extreme events will affect the crop (e.g. relationship between cropping rotation and planting time on level of damaged)<br>• To develop better capacity in using seasonal climate forecast in setting up cropping strategies (to avoid or minimize effect of floods and drought) |
| 7. | Learning about Water Balance Concept and Its Use To Assess Irrigation Water Requirement, and Flood Risk | • To develop better understanding the meaning of rainfall deficit from evapotranspiration<br>• To develop better capacity on how to estimate irrigation water requirement from based on simple water balance<br>• To assess risk of flood from water balance analysis |
| 8. | Assessing the Economic Value of Climate Forecast Information | • To develop better capacity to quantify the economic benefit of using climate forecast information |