

## Farmers Preparedness for Agricultural Contingencies in Krishna District of Andhra Pradesh

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### ABSTRACT

The study was conducted in Krishna district of Andhra Pradesh during 2014 -18. The agricultural contingencies in the research area mainly are delayed / early onset of monsoons followed by prolonged dry spells, untimely rains, drought during critical crop growth periods, heat waves, cold waves, prolonged increased day temperatures or prolonged low night temperatures, cyclones. Preparedness was operationally defined as having knowledge on crop management practices to overcome agricultural contingencies , planning to take up the measures, mobilization of resources and final adoption of the measures. The objective of the study was to find out the farmers preparedness for agricultural contingencies. As part of the study a knowledge test on crop management practices to be taken up by the farmers for agricultural contingencies was constructed. The test was used to assess the knowledge level of the farmers. the items were also used as checklist to ascertain further information on preparedness namely., planning, mobilization and adoption. The total sample considered for the study included 200 farmers. A great deviation is observed in the proportion of the respondents having knowledge and those adopting the measures. Many are failing to plan and mobilize the resources.

**Keywords:** *Agricultural Contingencies, Drought, Preparedness, Weather Aberrations.*

Agriculture is the major source of livelihood for more than two third of the Indian population. Rainfed agriculture accounts to 60 per cent of the total net sown area contributing to nearly half of the total food production in the country. Climatic conditions play an important role in agricultural production. It has profound influence on crop growth, development, incidence of pests & diseases, yields, etc. As a result of global warming the occurrence of unanticipated weather aberrations increased in the recent past. The unexpected weather aberrations are beyond human control. The agricultural contingencies mainly are delayed / early onset of monsoons followed by prolonged dry spells, untimely rains, drought during critical crop growth periods, heat waves, cold waves, prolonged increased day temperatures or prolonged low night temperatures, cyclones, etc. These weather abnormalities further give scope to other agricultural contingencies like epidemics and endemics in the crops. As agricultural contingencies act as barriers for the crop growth and development, they result in reduced crop yields. Ultimately causing serious economic losses especially to small and marginal farmers leading to agricultural distress. To reduce the risk of agricultural contingencies, some preparedness is required on the part of farmers to avoid last minute rush in solving the problem. To come out of this contingencies farmers need to take up pre contingent and post contingent measures for which predicting/ forecasting the situation is of at most importance. Farmers need to have awareness on the risk avoiding crop management

measures to be taken before, during and after the agricultural contingencies. Just awareness is not sufficient but planning & mobilization of necessary resources and implementing right action at right time can only rescue the farmers from these agricultural contingent situations. Hence, preparedness is not a single step process, it is the combination of knowledge, planning, mobilization of resources and adoption of the measures is cumulatively called as preparedness. At this juncture a study was planned to assess the farmers preparedness for agricultural contingencies.

### MATERIAL AND METHODS

The study was conducted in Krishna district of Andhra Pradesh using ex post facto research design during 2014 - 18. For the purpose of the study agricultural contingencies are operationalised as the unforeseen weather aberrations affecting crop growth and development. The agricultural contingencies in the research area mainly are delayed / early onset of monsoons followed by prolonged dry spells, untimely rains, drought during critical crop growth periods, heat waves, cold waves, prolonged increased day temperatures or prolonged low night temperatures, cyclones. Preparedness was operationally defined as having knowledge on crop management practices to overcome agricultural contingencies , planning to take up the measures, mobilization of resources and final adoption of the measures. The objective of the study was to find out the farmers preparedness for agricultural contingencies.

As part of the study a knowledge test on crop management practices to be taken up by the farmers for agricultural contingencies was constructed. The test comprised of questions called items. The test was used to assess the knowledge level of the farmers. The items were also used as checklist to ascertain further information on preparedness namely., planning, mobilization and adoption. The total sample considered for the study included 200 farmers. Frequency, percentage, item difficulty index, item discrimination index, point biserial correlation were used to represent the data in the study.

### Procedure for construction of Knowledge test

A knowledge test on crop management practices to be taken up by the farmers for agricultural contingencies was constructed. The test comprised of questions called items. The Items were framed based on the literature and consultation of experts. A total of 26 items were framed. Then the items were selected such that they differentiate the well informed sample from the poorly informed ones and should have certain difficulty value. The selected knowledge test items were pretested by administering to 60 farmers out of the sample area. Item analysis was carried out by administering the pretested items to 204 farmers and determining the "Item difficulty" index and "Item discrimination" index. Item difficulty index indicates the extent to which an item is difficult. Item discrimination index was used to find out whether an item really discriminates a well informed farmer from a poorly informed sample.

The data thus obtained was subjected to typical item analysis. The 26 test items were administered to each one of the 204 farmers. The scores assigned were one for correct answer and zero for incorrect response. After computing the total scores were obtained for each of the 204 farmers on 26 items. They were rank ordered. Based on which the farmers were divided into six equal groups labelled as G1, G2, G3, G4, G5 and G6 with thirty four farmers in each group. For the purpose of item analysis, middle two groups G3 and G4 were eliminated keeping only four extreme groups with high and low scores. Bases on the responses for each of the items, difficulty index, discrimination index and point biserial correlation were calculated.

### Item difficulty index

It is defined as the proportion of respondents giving correct answer to a particular item. Here underlying assumption is that difficulty is linearly related to the respondent's knowledge. The difficulty level was calculated using the following formula  $P_i = n_i / N$ . Where,  $P_i$  = Difficulty index in percentage of the  $i^{\text{th}}$  item;  $n_i$  = number of respondents giving correct

answer to  $i^{\text{th}}$  item;  $N$  = total number of respondents to whom the  $i^{\text{th}}$  item was administered. Item Difficulty index range from 0.30 to 0.90 was used for the study.

### Item discrimination index

It is defined as the extent to which an item discriminates the well informed individuals from the poorly informed ones. The item discrimination index given by Mehta (1958) was used.

$$E1/3 = \frac{(S1+S2) - (S5+S6)}{N/3}$$

Where,

S1, S2, S5 and S6 were the frequencies of correct answers in groups

G1, G2, G5 and G6 respectively;

N= Total number of farmers in the sample

E1/3 = Item discrimination index.

### Point biserial correlation

For dichotomous variables this correlation coefficient is used.

$$r_{pb} = \frac{M_p - M_q}{s} \times \sqrt{p_q}$$

Where,

$M_p$  and  $M_q$  = means of two categories,

$p$  = proportion of the sample in the first group,

$q$  = proportion of the sample in the second group and

$s$  = standard deviation of the entire sample.

### Reliability

Split half method was used to calculate the reliability coefficient. Segregation of odd number items and even number items was done and subsequently correlation value of two sets of data was calculated and the value was 0.73. Spearman-Brown formula was used to calculate the reliability coefficient of the whole test. The reliability coefficient of the whole test was 0.84 significant at 1 per cent level of significance.

### Validity

Content validity of the test was ensured as all the items of knowledge test was developed through consultation with literature and experts in the field of study. The content of the test entirely covered different aspects. Hence, it was assumed that the score obtained by administering the knowledge test of this study measures the level of knowledge of farmers on crop management practices to be taken up by the farmers for agricultural contingencies. Thus the knowledge test developed showed the greater degree of reliability and validity.

## RESULTS AND DISCUSSION

In the knowledge test for delayed onset of monsoon (early season drought) the difficulty index for the item 'with delayed onset of monsoons what should be the spacing in crops' was found to be 0.30, discrimination index (0.54) and significant rpb (0.9711). The item 'the duration of varieties selected in case of delayed onset of monsoons' difficulty index recorded was (0.84), discrimination index (0.32) and significant rpb (0.8234). For the item 'during early season drought what duration of crops should be preferred' the difficulty index recorded was (0.15), discrimination index (0.21) and rpb (0.3325). For the item 'type of irrigated preferred' the difficulty index recorded was (0.51), discrimination index (0.47) and significant rpb (0.7653). For the item 'what should be the plant population per square meter in rice' difficulty index recorded was (0.71), discrimination index (0.35) and significant rpb (0.9673).

For the item 'if the monsoons are delayed by more than 8 weeks what should farmers do' the difficulty index recorded was (0.70), discrimination index (0.32) and significant rpb (0.8465). For the item 'which irrigation system should be used during critical crop growth stages' difficulty index recorded was (0.60), discrimination index (0.47) and significant rpb (0.8935). For the item 'if one or two irrigations are possible during delayed onset of monsoon which crops to be preferred' the difficulty index recorded was (0.76), discrimination index (0.31) and significant rpb (0.8356).

In case of early onset of monsoon followed by prolonged dry spell for the item 'what should be the gap between inter cultivation to conserve soil moisture' the difficulty index recorded was (0.88), discrimination index (0.47) and significant rpb (0.9324). For the item 'what per cent of urea solution should be sprayed to supplement nutrition' the difficulty index recorded was (0.26), discrimination index (0.29) and rpb (0.7632). For the item 'how the vegetative growth in crops like cotton, redgram can be prevented' the difficulty index recorded was (0.19), discrimination index (0.23) and rpb (0.6522). For the item 'what should be done to short duration intercrops in a long duration main crop' the difficulty index recorded was (0.50), discrimination index (0.53) and significant rpb (0.7891). In case of dry spell at critical crop growth stages for the item 'what should be done to conserve soil moisture' the difficulty index recorded was (0.76), discrimination index (0.32) and significant rpb (0.8974). For the item 'what per cent of water soluble fertilizer should be sprayed to supplement nutrition' the difficulty index recorded was (0.38), discrimination index (0.61) and significant rpb (0.7982). For the item 'what growth need to be arrested by promoting reproductive growth'

the difficulty index recorded was (0.36), discrimination index (0.67) and significant rpb (0.8123). The findings are in line with that reported by Adesiji *et al.* (2012); Shankar *et al.* (2013); Roy *et al.* (2014); Mburu *et al.* (2015); Jena and Acharya (2016).

In case of excess rains/cyclones for the item 'when should the excess water be drained after rains' the difficulty index recorded was (0.78), discrimination index (0.33) and significant rpb (0.9432). For the item 'what is the fertilizer dose called which is applied after cessation of rains' the difficulty index recorded was (0.71), discrimination index (0.38) and significant rpb (0.9562). For the item 'after cessation of rains the what nutrients should be included' the difficulty index recorded was (0.78), discrimination index (0.46) and significant rpb (0.9673). For the item 'what is replacing the dead plants after excessive rains' the difficulty index recorded was (0.72), discrimination index (0.53) and significant rpb (0.9125). For the item 'for what outbreaks the measures should be taken after cyclones' the difficulty index recorded was (0.28), discrimination index (0.25) and rpb (0.6735). For the item 'what concentration of common salt is sprayed on panicles to prevent germination and spoilage of straw from moulds in harvested crop' the difficulty index recorded was (0.22), discrimination index (0.19) and rpb (0.7132). For the item 'what concentration of  $KNO_3$  is sprayed to support nutrition' the difficulty index recorded was (0.19), discrimination index (0.23) and rpb (0.6834). For the item 'As a prophylactic measure, what fungicides are to be sprayed 2-3 times by rotating the chemicals to prevent rots' the difficulty index recorded was (0.83), discrimination index (0.41) and significant rpb (0.8762).

In case of extreme events like heat wave, cold wave, frost for the item 'whether to apply booster fertilizer dose or not' the difficulty index recorded was (0.61), discrimination index (0.42) and significant rpb (0.9762). For the item 'how the water soluble fertilizer like 19-19-19, 20-20-20, 21-21-21 should be applied @ 1% to support nutrition' the difficulty index recorded was (0.37), discrimination index (0.65) and significant rpb (0.8542). For the item 'whether micronutrient sprays are preferred or not' the difficulty index recorded was (0.81), discrimination index (0.36) and significant rpb (0.8126). The findings are in line with that reported by Nomcebo *et al.* (2017); Sanjeevi and Kumar (2018); Anseera and Alex (2019).

The items with difficulty index and discrimination index 0.30 to 0.90 was considered for the study, thus retaining 20 items out of 26 items.

Preparedness was studied in four steps. Among the five agricultural contingencies more than three fourth of the respondents had knowledge on the crop improvement measures to be taken for delayed

onset of monsoon / early onset of monsoon followed by prolonged dry spell (78.50%), while 70.50 per cent of them planned to take measures, only 26.50 per cent of them mobilized the necessary resources and 26.00 per cent adopted the measures at field level. Majority were aware of the measures for dry spell at critical crop growth stages (84.50%), while 68.00 per cent of them planned to take measures, only 17.50 per cent of them mobilized the necessary resources and adopted the measures at field level.

Majority were aware of the measures for excess rains and cyclones (92.50%), while 86.00 per cent of them planned to take measures, only 71.50 per cent of them mobilized the necessary resources and adopted the measures at field level. Majority were aware of the measures for extreme events like humid weather conditions (56.00%), while 55.50 per cent of them planned to take measures, only 52.00 per cent of them mobilized the necessary resources and 51.00 per cent adopted the measures at field level. Majority were aware of the measures for extreme events like prolonged low night temperatures (71.50%), while 64.00 per cent of them planned to take measures, only 63.50 per cent of them mobilized the necessary resources and 62.00 per cent adopted the measures at field level.

A great deviation is observed in the proportion of the respondents having knowledge and those adopting the measures. Many are failing to plan and mobilize the resources due to several factors like the non availability of the information about the sources to get the necessary materials, lack of time and scarcity of funds, etc. although a greater proportion of the respondents have knowledge but it is not being materialized which need to be looked upon seriously.

### CONCLUSION

Farmers may not plan and mobilize when they are as individuals, but could be made possible with some institutional support like formation of groups or farmers organizations. More over the situation of contingencies need to be addressed by special body formed for the purpose may be district contingency cell. Establishment of such bodies can create more awareness to farmers on necessary risks, measures and make the farmers well equipped with information on sources of availability, thus preparing them for contingencies.

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