

Significance and and Relevance of Contingency Planning in Agriculture

Neha Kumari¹ and Arun Kumar Sharma²

Abstract

Agriculture has always been considered a gamble with Nature. Rainfall patterns are difficult to predict and so farmers have devised alternate farming systems appropriate to their specific agroecosystems, groundwater situation, soils, rainfall patterns, weather conditions and crop seasons. Indigenous knowledge traditions have a large store of technical information and farmers' practices to cope, mitigate, adjust and manage the risks, uncertainties and adverse effects of aberrant weather conditions. An alternative plan being ready in case of failure of original plan due to sudden changes in weather and farm conditions can be called a contingency plan. Contingency planning in agriculture assumes great significance in today's climate change effects and aberrant weather conditions, to reduce the losses and damages to crops and farms. Contingency planning helps farmers to prepare for any eventualities and get the best out of emerging adverse situations in farming and manage to reduce crop losses.

Keywords: Contingency plan, real time contingency crop planning, Initial preparedness

Introduction:

In one of the Prof. B. Vishwanath Memorial Lectures in the IARI Convocation, Prof. M.S. Swaminathan has reiterated the significance of contingency planning in agriculture. He stated that the very fact of inception of Imperial Agricultural Research Institute in Poosah village in Darbhanga district of Bihar was the result of contingency planning. As an ameliorative measure for making a difference in the condition of farming in British India after the heavy toll of famines during 1876-78 and 1899 to 1900 in eastern provinces of India,

Imperial Agricultural Research Institute was established in 1905.

Now contingency planning in agriculture has become the most frequently used term and the norm for every agricultural development professional to prepare and be ready with plans combat the aberrations of climate change and hence, it assumes great significance in agriculture today. So this article attempts to understand what contingency planning in farming actually constitutes, why it is so important today and how is it done.

Meaning of contingency

According to American Dictionary,

Neha Kumari¹ and Arun Kumar Sharma²

¹Ph.D. Scholar, Department of Extension Education, Bihar Agricultural University, Sabour, Bihar.

²Block Project Manager, HPCDP-JICA (ODA) Phase-II, Department of Agriculture, Chambaghat, Solan, Himachal Pradesh

contingency means ‘something that might possibly happen in the future, usually causing problems or making further plans and arrangements necessary’. A contingency plan is an arrangement for dealing with something that might possibly happen or cause problems in the future. In all probability, one must be able to deal with all possible contingencies to overcome the problems. Having concern for contingency planning amounts to *‘hoping for the best and yet preparing for the worst!’*.

Contingency indicates the preparedness of people and reflects the coping ability and skills of people. It means evasion of adversities and being prepared to meet any untoward incidents of irreparable loss or damage. In farming, if the onset of rains gets delayed or if timely rains do not fall at critical growth stages of crop plants, it amounts to a contingency, which may adversely affect the crop yield leading to possible economic loss. Contingencies are events or occurrences that can be foreseen, predicted and hence may be evaded, escaped or coped, adjusted, mitigated or adapted to manage risks and reduce the impact of possible damage or loss.

Contingency plan is a sort of secondary plan in case the first plan fails. Contingency plan is a sort of Plan B. Such a plan will help farmers to be prepared for facing the loss and managing the risks involved. Farmers have all along used such contingency plans in farming

as they were well aware that farming is a gamble with Nature, especially with rains.

Farmers’ Wisdom in Contingency Planning

In the districts of dryland tract of Rayalaseema in Andhra Pradesh, and in the adjoining districts of Karnataka, farmers have been practicing contingency plans in farming. As this area lies in the rain-shadow region, normal south-west monsoons fail to cover this area. Only south-east rains come in September usually after the withdrawal of south-west monsoons. Here the sowing season is called Maghi season as it comes in late kharif or early Rabi. Farmers practice dryland or rainfed farming as no irrigation facility is available. Here farmers plough their lands and wait for onset of rains. As soon as rains fall, they broadcast seeds of four different crops: castor, gingelly, Italian millet (Korra in local parlance) and red gram (pigeon pea). Italian millet is a minor millet and cereal crop and red gram is a pulse crop. Gingelly or Til is an edible oilseed crop and castor is a non-edible oilseed and cash crop.

Farmers use their native knowledge in growing these four crops as mixed cropping. With moisture available in the soil from the first rains, all the crop seeds germinate and grow. If rains are normal, farmers will reap all four crops and enjoy richer harvest. If subsequent rains fail, the first crop that may dry up and die is gingelly, as gingelly plants

are very tender and succulent. Then, if more rains fail, red gram crop may also fail. But, Italian millet and castor would survive through drought spell and continue to grow and give substantive yields and ensure millet food for the farmers' households, while castor crop will earn a good income for survival and sustenance of farm households.

This type of contingency cropping is highly location specific due to variation in amount, time and distribution of rainfall. Especially in semi-arid and arid regions, the spatial distribution of rainfall is highly variable. It is common to observe that rainfall received varies from field to field in the same location.

The contingency crop planning is a treasure of traditional wisdom of dryland farmers. This is a good example of farmers' coping ability of being smart with climate and managing risks in farming.

Current Relevance of Contingency Crop Planning

Agricultural scientists, working on dryland / rainfed farming, have studied the various parameters of weather and climate and continued to observe the behavior of monsoons, winds, relative humidity, and atmospheric temperatures in the farm fields, research-based-evidence can be pooled to give a set of recommendations on the choice of crops, crop varieties of different durations,

resistance of crops to abiotic stress, efficient use of available soil moisture, conserving in situ soil moisture through mulching and appropriate farm technologies to reduce risks and ensure good yields.

Over the last several decades, researchers have concentrated on methods of increasing crop production under rainfed conditions in order to mitigate drought effects at farm level. Simple and easily implementable practices were developed for enhancing the yields even in dry years. This improved crop husbandry insulates crops against mild stress and helps to increase yield stability. To meet the weather aberrations, alternate crop strategies, mid-season correction and crop life saving techniques form important components.

Depending upon the date of receipt of rainfall, crops are selected. It is assumed that the rainfall for the subsequent period is normal and depending upon the economic status of the farmer, certain amount of risk is taken to get good profits if season is normal or better than normal. Contingency cropping is highly location specific due to variation in amount and distribution of rainfall. Especially in arid regions, the spatial distribution of rainfall is highly variable. It is common to observe that rainfall received varies from field to field in the same location. Temperature gradually falls from August onwards reaching minimum in November and December. Contingency plan

and midterm corrections vary with the type and time of occurrence of rainfall aberration. Crops have to be selected with suitable crop duration to coincide with the length of the growing season. Generally short duration pulses may suit the situation. However, if the monsoon turns to be extraordinarily good, opportunity is lost if only short duration crops are sown. Farmers with economic strength and motivation for high profits with some amount of risk can go for crops of long duration. The long duration crops with flexibility or elasticity in yield are more suitable.

Preparedness for Implementing Contingency Crop Planning

Any contingency planning must be viewed as a dynamic process requiring a continued attention and can be tackled by drought coping practices implemented in the form of Real time Contingency Planning (RTCP). Any contingency plan implementation should have initial preparedness for meeting any kind of weather aberrations, data on appropriate coping strategies during crop season such as late onset, mid-season droughts terminal droughts or any kind of extreme events. For these two steps, village level institutions play greater role to provide inputs such as suitable seed, fertilizers, need based farm implements during crop growing season.

Initial preparedness is must in order to ensure implementation of contingency plan in

real time. All stakeholders need to be ready with drought management instruments including conserving soil moisture, harvesting excess water efficient recycling and other crops soil and agronomic strategies that enhance water use efficiency (WUE) and water productivity. A combination of tolerant crops and cropping systems, cultivars, soil and nutrient management should be of integral part of the overall agricultural contingency plan. To facilitate these interventions suitable farm implements, inputs and need based fodder systems are essential.

Various components of “Preparedness”, which are “*Must Do Practices*” that are essential and need to be arrange and facilitated for getting ready for contingency planning. These are: (i) provision of essential inputs, (ii) Agronomic practices, (iii) Agricultural machinery and equipment, (iv) Water management practices, (v) Fodder systems for farm animals. These are detailed here

(i) Provision of Essential Inputs

- **Seed Banks:** Seeds of different and suitable crops, alternate crops, improved crop varieties, crop varieties with special characteristics like biotic/abiotic stress tolerance, pest and disease resistance, etc., These are required and need to be kept ready for easy access in local seed banks.

- **Nutrition Banks:** Organic manures, farm yard manures, green manures and green leaf manures, etc., aid in organic recycling. These manures easily mix with soil and aid in maintaining soil temperature and soil moisture. They can also act as good soil mulches to ward off extra heat from scorching sun and reducing evaporation of soil moisture. Tank silt is made available for enriching soil structure and soil fertility in light sandy loam soils.

(ii) Agronomic Practices

- Sowing across the slope and after initial inter-culture operation, small ridges will reduce the speed of flow of rain water across the field.
- Ridge and furrow method if ploughing is another agronomic practice that allows for soil moisture conservation or water logging as required by crops sown on ridge or in furrow.
- Foliar spray of nutrients to enhance nutrient use efficiency, reduce wastage (through leaching) of fertilizers applied to soil.

(iii) Agricultural Machinery and Equipment

Machines like ridge maker, bund maker, broad bed maker ploughs are needed to enable farmers practice the particular recommended practice of bonding, ridge and furrow method or broad bed – sunken bed

sowing methods. Groundnut planter may accelerate sowing operations to allow for timely sowing in a large area. Similarly zero-tillage machines will also help sowing to capture available soil moisture for good germination.

(iv) Water Management Practices

Rainwater harvesting is the most essential component of being prepared for contingency planning.

- A farm pond needs to be dug at the far end of the slope of the field to collect rainwater. This farm pond will take care of a life –saving irrigation to the crops in case of a long dry spell.
- Percolation tanks enable increased storage of groundwater as rainwater is collected through the percolation tanks.
- Setting up of a micro-irrigation system with either a sprinkler or drip irrigation system is essential to increase water use efficiency and reduce wastage of water.
- Setting up fertigation systems to conserve both water and water soluble fertilizers

(v) Fodder Systems for farm animals

- Community Fodder Bank: A fodder bank needs to be established at community level to enable regular supply of fodder to all animals in the villages. Efficient fodder systems (fodder sorghum, berseem, fodder mungbean, etc.,) need to be incorporated in

farming systems in villages for provision of assured and adequate fodder supply (green and dry) for livestock. Napier grass can also be grown on bunds near tubewells.

- Maize crop grown and used for silage making, after harvesting tender maize cobs for sale. Cattle love eating silage grass. Farmers need to be taught on how to silage green maize plants.
- A common pasture land needs to be maintained through social fencing, a method where in all farmers agree to not graze their animals in pasture land so as to allow grass to grow well and later share the cut grass for stall-feeding their cattle.

Stakeholders in implementing Real Time Contingency Plans (RTCP) in Agriculture

A consortium of research organizations, farmers, farmer groups, agricultural extension officers, KVKs, Line departments, ATMA, district collectors district level NDMA staff, NGOs, need to come together to implement real time contingencies at farm level.

Collective action yielded into reducing negative impacts of weather aberrations which ultimately address the food production at farm gate and food security at national level. Thus, agricultural contingency planning is a dynamic process integrating the efforts, programmes and schemes of all stakeholders and bringing

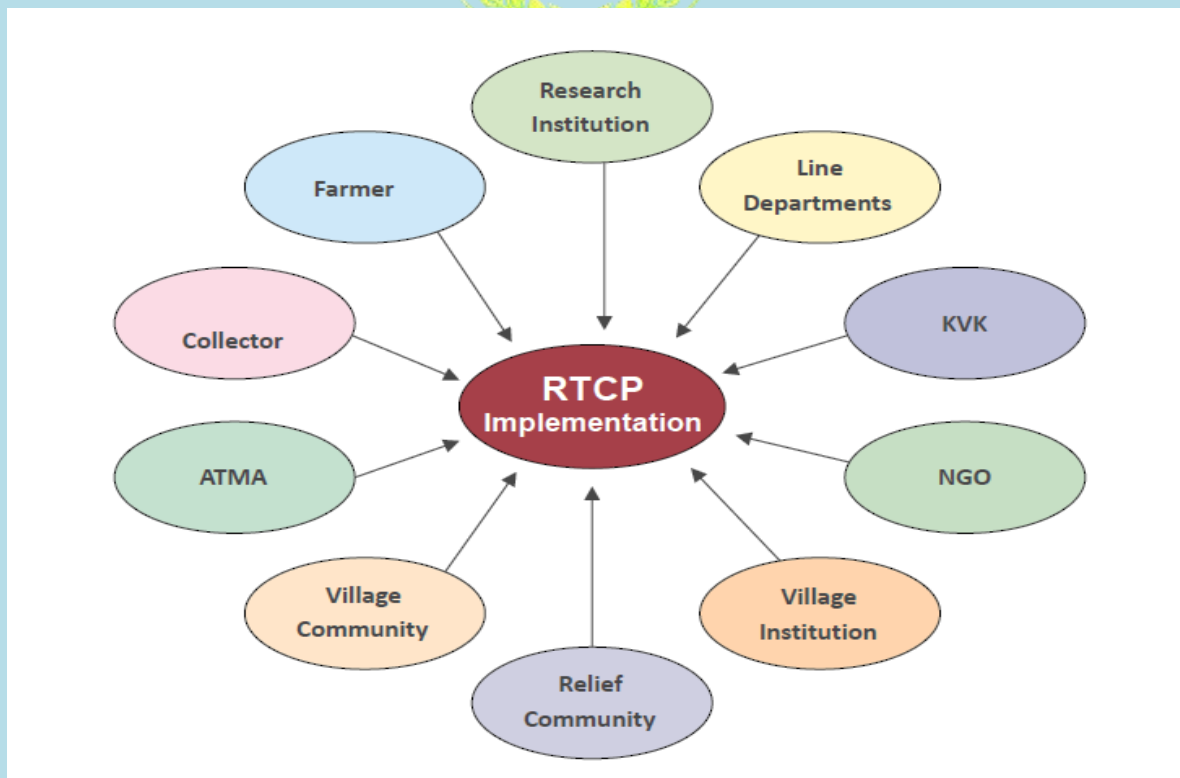


Fig.1 Stakeholders in implanting Real Time Contingency Planning (RTCP) in Agriculture

about convergence in integrated effort.

Conclusion

Contingency planning in agriculture has become a dire necessity nowadays. Every organization including SAUs, ICAR institutes, State departments of agriculture, ATMA officials, district administration, input distribution agencies, non-governmental organizations and farmers' groups, etc., are all involved in preparing contingency plans and implementing them. Contingency cropping is growing of a suitable crop in place of normally sown highly profitable crop of the region due to aberrant weather conditions. The benefit of having an alternate plan or contingency plan allows for getting the best of adversity and reducing any losses. It is really a good practice that all stakeholders understand well and use it for the benefit of all concerned.

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