

agMOOCs

Cost benefit analysis for the case study done on crop management

T.N. Balasubramanian

Dear student and my dear farmers. In these past lesson series especially on the last three classes we have seen case studies on crop management, case studies on pest and disease management and case studies on livestock and poultry.

(Refer Slide Time: 00:35)

Cost benefit analysis for the case study done on crop management

Ex-ante analysis

Weather situation: "anticipating wet spell of six days with rainfall of more than 10 mm day⁻¹" during sowing nursery

Agro Advisory: The proposed agro met advisory is to irrigate the nursery after sowing in the evening hours of a day anticipating rainfall and drain it on next day morning and this be continued for two days till the rice plumule comes-up.

Table 1. Partial budgeting for agro met advisory – Nursery establishment

Stage of the crop	Losses	Amount (₹) per 4000m ²	Gains	Amount (₹) per 4000m ²	Estimate change (₹) (Gain -Loss)
Nursery establishment (R1)	Additional cost on account of irrigation for two days	600	In terms of realization of additional grain yield of 400 kg @ ₹10 per kg since seedling establishment was better in this case	4000	-
	Reduced returns	-	Loss avoided on account of re-sowing	500	-
	Subtotal	600	Subtotal	4500	3900

Now let us try to examine the cost benefits ex-ante analysis. The weather situation is anticipating wet spell of six days with the rainfall of more than 10 mm per day and the stage of the crop is nursery stage one day after sowing. We are going to receive about 60 millimetre. The agro advisory is you irrigate on the evening hours and drain it in the next day morning and this may be continued for the two days till the germinated seedling gets established.

Now let us see the cost-benefit analysis. If farmer has adopted this technology what amount of money he will get by adopting this technology or I can say that how the risk is being reduced in terms of money. So by doing this operation he is giving irrigation, the first today evening next day draining, it is getting repeated for two days, the cost comes to 600 rupees. Is there any reduced resistant to do this irrigation? No. So subtotal is 600 rupees. Now let us go for the gains. In terms of realization of additional grain yield of 400 kg at rupees 10 per kg since seedling establishment was better in this case by providing irrigation and draining in the next day. So he gets an amount of rupees 4000 rupees per acre or per 4,000 meter square.

Loss avoided on account of re-sowing, there was no re-sowing, because it was protected by providing irrigation and draining in the next day that was again 500 rupees. So totally the farmer gets about 4500 rupees, what he spent around 600 rupees, so there is here benefit of 3900 rupees per acre, per 4000 meter square. If this technology was not done the farmer has to go for re-sowing and he has to lose the time also, seasonal time sowing is lost, seasonal

transplant timings lost, so against that if you go for this agro advisory based on the anticipated weather the farmer gets about 3900 rupees as an additional income in turn in addition he also reduces the crop production losses.

(Refer Slide Time: 03:51)

Cost benefit analysis for the case study done on crop management

Weather situation: Weather situation "anticipating wet spell of six days with rainfall of more than 25 mm day⁻¹" when crop had reached maximum tillering stage.

Agro Advisory: The proposed agro met advisory is to provide drainage to drain excess rainwater so as to ensure no water stagnation for proper tiller development.

Table 2. Partial budgeting for agro met advisory – Peak Vegetative Growth

Stage of the crop	Losses	Amount (₹) per 4000m ²	Gains	Amount (₹) per 4000m ²	Estimate change (₹) (Gain -Loss)
Peak vegetative growth (R5)	Additional cost on account for providing drainage	1200	In terms of having 3-4 extra tillers per plant with additional number of grains per plant (~500) thus 600 kg higher yield @ (₹) 10 per kg	6000	-
	Reduced returns	-	Reduced costs	-	-
	Subtotal	1200	Subtotal	6000	4800

Next we move to another ex-ante analysis for your weather situation, anticipating wet spell of six days with rainfall of more than 25 mm per day that is 150 millimetre at the time of tillering stage of the rice. Now the agro advisory is you drain the excess water so that the tillers will be developed very effectively. Now the additional costs on providing drainage it comes to 1200 rupees per acre or per 4,000 meter square. Is there any reduce to return due to this providing drainage? No. Then total your losses or total additional cost is 1200 rupees. What would be the gains? So in terms of having three to four extra tillers per plant by draining the water he gets additional 600 kg higher yield at a 10 per kg, that is 10 per kg. So the total amount he gets is around 6,000 rupees. Is there any reduced to cost? Nothing. So total benefit is 6000 rupees, total cost is 1200 and if you deduct the farmer gets 4800 rupees.

What I like to say is by doing simple drainage with a cost of 1200 rupees the farmer is going to get 4,800 rupees addition then you get 150 mm rainfall consecutively over six days. Is it not a benefit to the farmers? Is it not a benefit to the nation? Is not a benefit to your grain production? So we have to retune or refine our agrumet advisories based on the anticipated weather forecast, when farmer is being adapted he gets your additional income in addition to crop losses also.

(Refer Slide Time: 06:09)

Cost benefit analysis for the case study done on crop management

Weather situation: "anticipating high relative humidity (40 – 90%) combined with prevalence of minimum temperature <20°C" at maximum tillering and panicle initiation stages of rice.

Agro Advisory: The proposed agro met advisory is to adopt timely plant protection measures.

Table 3. Partial budgeting for agromet advisory – disease management

Stage of the crop	Losses	Amount (₹) per 4000m ²	Gains	Amount (₹) per 4000m ²	Estimate change (₹) (Gain -Loss)
Blast and <i>Helminthosporium</i> leaf disease management (R6)	Additional cost on account of adopting appropriate disease control measure	1500	In terms of additional grain yield of 500 kg @ ₹ 10 per kg	5000	-
	Reduced returns	-	Reduced costs	-	-
	Subtotal	1500	Subtotal	5000	3500

Let us see one more example for another situation where anticipating high relative humidity combined with the minimum temperature especially for the panicle initiation of rice. Now we have seen in the last classes that whenever this situation occurs you may get your blast or your helminthosporium diseases in rice, so in the advisory is to go for plant protection, whether you go for (inaudible 00:06:42) spray with these two chemicals. So these disease, anticipate this disease to be initiated based on your forthcoming weather, go for spraying. You will be spending 1500 rupees per acre or 4000 meter square, so total cost comes to 1500 rupees per acre. What would be the additional benefit by doing this plant protection measures. So additional yield is 500 kg at rupees 10 per kg, so you will be getting 5,000 rupees, by doing simply one spray you are getting 5,000 rupees by spending 1,500, hence the farmer gets an additional benefit of 3,500 rupees.

So when all farmers do these agromet advisories or executed this type of agromet advisories means automatically they also get benefited in terms of money, but also you reduce the disease instance and also you reduce this spread of this disease across the rice area. (Refer Slide Time: 07:56)

Summary

- Results were clearly revealed that by adopting agro met advisory at field level would offer possible benefits to the farmers in terms of providing enhanced cash flow by reducing weather and climate related rice production risks.
- The study hypothesis envisaged that whenever weather based agro met advisory is adopted by the farmers, there would be profound reduction in crop production risks.

I also have to say, sum that summary, the results were clearly revealed that, I also like to focus based on the case studies, based under your cost-benefit analysis, by adopting agromet advisory at the field level would possible benefits for the farmers in terms of providing enhanced cash flow, cash is being regularly available to the farmers by reducing the weather and climate related rice production risk. They study hypothesis envisaged that whenever weather based agromet advisory is adopted by the farmers this is very very important. Whenever weather based agromet advisory is adopted by the farmers there would be profound reduction in production risks rather than I can say that weather-related crop production risk.

So all farmers in the India or across the world must go for hereafter weather based farm decisions so that crop production can be sustained to meet the food demand from the growing population. Thank you very much.