SOCIO-ECONOMIC IMPACT OF NHM SCHEME ON WATERMELON FARMERS IN DEOGARH DISTRICT OF ODISHA

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——————— **ABSTRACT** ———————

The objective of the paper is to analyse the impact of National Horticulture Mission (NHM) on Watermelon farmers in Deogarh district of Odisha. The study is based on both secondary data and primary data and has used bar diagrams, percentage, regression as techniques of analysis. Watermelon has come up as a major horticultural crop in Deogarh district of Odisha since many decades as it is contributing a lot to its agro-economy. Farmers of different categories have started adopting this crop in their cropping system and production as well as productivity in watermelon farming has also increased. with the help of National Horticulture Mission (NHM), watermelon farmer's socio-economic impact has witnessed a change. Since the NPV is Rs.2.48 lakhs and positive, it is feasible and profitable to go for the water melon production. The Government and nongovernmental agencies should stimulate more participation in watermelon production in the sample villages of Barkote block in Deogarh district by providing trained agricultural extension staffs.
KEYWORDS: *Economy, Farmers, Horticulture, Income, Profit, Watermelon.*————

INTRODUCTION

National Horticulture Mission (NHM) is an Indian horticulture Scheme promoted by Government of India. It was launched under the 10th five-year plan in the year 2005-06. While Government of India contributes 85%, and 15% share is contributed by State Governments. NHM aims at holistic growth of horticulture with an integrated approach covering Production of planting material, vegetable seed, seed infrastructure in public and private sector, establishment of new gardens on farmers lands, rejuvenation / replacement of senile plantations, technology dissemination through front line demonstrations, post harvest management etc,. Time to time, the NHM guidelines have been revised and additional components such as high density planting, mushroom cultivation, horticulture mechanization, GAP certification are included. The cost norms of the activities such as nurseries, area expansion and protected cultivation, post harvest management, market related components have been liberally enhanced to encourage speedy developments in critical areas and to bring in private sector participation.

OBJECTIVES OF THE STUDY

1) To study the socio-economic impact analysis of NHM with respect to watermelon farmers in the study areas of Deogarh district of Odisha which is attached with convergence of other schemes and programmes.
2) To analyse the Year wise Growth of production in hectres & Trend of productivity of watermelon in the study areas of Deogarh district of Odisha attached with NHM scheme in convergence with other schemes.
3) To investigate the factors perceived & constraints faced by the watermelon farmers in the study areas of Deogarh district of Odisha with impact of NHM scheme in convergence with other schemes.
4) To examine the Cost- Benefit analysis of watermelon farming project in the study areas of Deogarh district of Odisha with impact of NHM and convergence with other schemes.

DATABASE AND METHODOLOGY

Deogarh district representing North western plateau agro climatic zone of Odisha state was purposively selected for the study considering its highest percentage of area under plateau ecosystem as well as under watermelon cultivation.

1) Sources of Data Collection

The sources of data collections were both primary as well as secondary. Socio-economic status of watermelon farmers in the study areas in Deogarh district of Odisha were collected from field survey with primary data collection and a structured questionnaire is being used. Production & trends in productivity in watermelon farming, factors perceived and constraints faced by watermelon farmers and cost-benefit analysis in watermelon farming in the study areas of the district were collected from secondary sources.

2) Sampling techniques used

Simple random sampling is being used for selection of household or respondents survey and purposive sampling is being used for selection of areas. 100 respondents or watermelon cultivators from five sample villages viz., Mardang, Raitabahal, Madhyapur, Dantaribahal and Khajurikhaman of Barkote block in Deogarh district is being taken for study purpose.

3) Statistical tools used

Using MS-Excel, the basic Percentages, Arithmetic means of socio-economic status of watermelon farmers, factors perceived by Watermelon farmers in adoption of watermelon cultivation in Deogarh district of Odisha, Constraints perceived by the watermelon cultivators in its commercialization, Karl Pearson's Correlation coefficients and the analysis between selling price per kg of watermelon (Rs.) and Quantity (kg) of watermelon sold have been found out too using MS-Excel. Using SPSS Software, Regression analysis with ANOVA between selling price per kg of watermelon (Rs.) and Quantity (kg) of watermelon sold has been found out, Cost Benefit analysis of watermelon farming with impact of NHM from the years 2015-2020 with calculating the Benefit-Cost ratio were find out and the analysis has been done. Subsequently, column graphs, line chart and scatter plots of various data have been analyzed with the justification of the objectives.

LITERATURE REVIEW

There is scanty literature on horticulture but relevant literature is reviewed. Davis et al. (2006) demonstrate that in watermelon this genetic potential can be greatly affected by environment and some germplasm appear to be affected to a greater extent than others. Huitrón et al. (2007) demonstrated that 2,4-D produced triploid watermelon with higher sugar content than CPPU set fruit. Mills (2008) demonstrated that during ripening excessive rain, severe drought, nutrient stress, and disease or insect damage can decrease sugar accumulation. Mankar et al. (2013) reported that, 57.50 percent of NHM beneficiaries had 11 to 20 years of farming experience followed by 26.67 percent had up to 10 years and only 15.83 percent had more than 20 years of framing experience. Rabbany et al. (2013) conducted research on the cost of production analysis of watermelon. Yusuf et al. (2013) also reported profitability and adoption of watermelon technologies by farmers. Ibrahim et al. (2014) explored technical efficiency and its determinants in watermelon production. However, very little is known about agrochemicals usage by watermelon farmers. On the other hand, various studies were conducted on the use of organic inputs in various crops farming. Rana et al. (2017) examined the organic vegetable cultivation attitude of the farmers. Again, very limited information was found that assessed the watermelon farmers' willingness to adopt organic inputs. Hence, the present study was conducted to contribute to the literature by evaluating the watermelon farmers' agrochemicals usage and assessing their willingness to adopt organic inputs. Tur-Cardona et al. (2018) explored the acceptance of bio-based fertilizers in European countries. Salam et al. (2021) evaluated the impact of organic fertilizer on the yield and efficiency of rice.

RESULTS AND DISCUSSION

The primary data collected from water melon producers are analysed and economic particulars of the farmers are shown in table-1.

Table-1 Economic indicators of water Melon in sample villages

Particulars		Mardang	Raita bahal	Mad hyap ur	Dantar ibahal	Khaju rikha man	Total	%	Avera ge
Selling Price per Kg of Watermelon (Rs.)	5.00-10.00	10	15	0	5	10	40	40.00	8.00
	10.00-15.00	10	5	20	15	10	60	60.00	12.00
	15.00 and above	0	0	0	0	0	0	0.00	0.00
Total							**100**	**100**	
Quantity (Kg) sold per day	0-5	10	15	0	5	10	40	40.00	8.00
	5-10	10	5	20	15	10	60	60.00	12.00
	10 and above	0	0	0	0	0	0	0.00	0.00
Total							**100**	**100**	
Hours Spend per day in watermelon farming	3-5	0	0	0	0	0	0	0.00	0.00
	5-7	0	0	0	0	0	0	0.00	0.00
	7 and above	20	20	20	20	20	100	100.00	20.00

Source- Field data

In the quantity (kg) sold per day category, 40 respondents sell 0-5 kg of watermelon per day with a mean average of 8.00 whereas 60 respondents sell 5-10 kg of watermelon per day with a mean average of 12.00. In the hours spend per day in watermelon farming, out of 100 respondents, all the beneficiaries spend 7 hours and above in the field for watermelon farming with a mean average of 20.00. In the type of buyers' category, out of all the 100 respondents, all are local people who come to buy from the farmers with a mean average of 20.00. In the Distance (km) from home to sell point category, out of 100 respondents, 40 beneficiaries sell their produce within a distance range of 0-1 kms with a mean average of 8.00, 40 beneficiaries sell their produce within a distance range of 1-2 kms with a mean average of 8.00 and rest 40 beneficiaries sell their produce within a distance range of 2 kms and above with a mean average of 4.00.

Table- 2: Factors perceived by 100 Watermelon farmers and their ranking in adoption of watermelon cultivation in Deogarh district of Odisha

Sl. No	Factors	Rank
1	Marketability	II
2	Profitability	I
3	Less insect pest menace	VII
4	Input consumption is less	IX
5	Less duration	IV
6	Less risk	VI
7	Low investment	VIII
8	No extra skill is required for cultivation	V
9	Self-engagement during the leisure period	III

Source: Primary Data & Opinion Survey.

From the Table-2, ranking is being done in accordance with factors perceived by watermelon farmers in adopting watermelon cultivation of 100 respondents in the sample study villages of Barkote block in Deogarh district. Perception of farmers on the causes of adoption of watermelon cultivation in their cropping system and their constraints were measured in a scale of 0, 1, 2 scores, allotted to disagreed, partially agreed and agreed respectively and ranked accordingly. It is clearly seen that Profitability is the factor which attracts the farmers in cultivating the produce and it is ranked 1. Consumption of inputs is the factor which is ranked 9.

Table No. 3: Constraints perceived by 100 watermelon cultivators in its commercialization

Sl.No	Constraints	Rank
1	Poor quality production	XIII
2	Pest and disease problems	XI
3	Lack of crop insurance	V
4	Inadequate credit facilities	VII
5	Timely fertilizer unavailability	XII
6	Lack of storage facilities	IV
7	Value addition of the produce	XIV
8	High transportation cost	III
9	Poor marketing facilities	X
10	Instability in market price	II
11	Non-availability of adequate manpower	VIII
12	Increase in the cost of inputs	I
13	Inadequate irrigation facilities	IX
14	Uncertainty in weather condition	VI

Source: Primary Data & Opinion Survey

From the Table-3, it shows the constraints faced by watermelon farmers in the sample study villages of Barkote block in Deogarh district. Constraints were also measured in the same scale and ranked to ascertain the major problems in this enterprise as perceived by the farmers. It was observed from the above table that increasing the cost of inputs like hybrid seeds, fertilizers, pesticides and human labour were the major constraints of the watermelon cultivators. Fluctuating market price of watermelon in subsequent years was the second most important constraint faced by the farmers. Though the government sponsored cooperative body, RMC was playing a crucial role in attracting the traders for a competitive market; it was not able to fix the price of the produce. High transportation cost was also found a major constraint which ranked third among the constraints. Watermelon, being a perishable item, could not be kept for a long duration in farmer's condition. Lack of proper storage facilities sometimes was compelling farmers to sell their produce in lower rate. This was found to be the fourth major constraint. Value addition of the produce was found as the least important constraint for commercialization. During the opinion survey, it was noticed that the farmers were not aware about the value addition of watermelon which could add more values to their produce. This scored the lowest rank. Farmers did not perceive fertilizer availability and pest problems as major problems. During the opinion survey it was observed that they were more concern of their cost than their availability. Quality consciousness was found lacking in most of the farmers. Quality was not a parameter for the farmers while growing of the crop till the year, 2000. During discussion it was found that farmers were not aware of the grading, storing, sugar content, colour and lustre of the produce as well as residual toxicity in them. It came in the minds of the farmers when an attempt of RMC to export the produces abroad was not materialized due to failure in passing the safe residual toxic level. Uncertainty in weather condition like heavy rainfall, hail storm, cyclone etc. causes loss to watermelon crop. Such type of apprehensions and lack of insurance were also major factors against popularisation of the crop.

Table - 4: Increase in Watermelon Production area and Productivity in Deogarh District

Year	Ha	q/ha
2015	20	300
2016	30	350
2017	40	420
2018	50	530
2019	60	640
2020	70	650

Source: District Statistical Handbook, Deogah

Year wise growth of watermelon production in hectres in the study areas of Barkote block in Deogarh district has been shown in table-4 along with Q/ha. In the year 2015, the production of watermelon was 20 ha which increased to 30 ha in 2016, to 40 ha in 2017, to 50 ha in 2018, to 60 ha in 2019 and to 70 ha in 2020. The year wise trend of watermelon productivity with respect to quintal/hectre in the study areas of Deogarh district. In the initial year of 2015, the productivity was 300q/ha to 350q/ha in 2016 which increased to 420q/ha in 2017 which increased to 530q/ha in 2018 which increased to 640q/ha in 2019 which increased to 650q/ha in 2020.

Correlation Coefficients
Two variables i.e., selling price of watermelon per kg (Rs.) and Quantity (Kg) sold per day of watermelon farmers are taken for obtaining the correlation coefficients which is as follows:

Table-5: Correlation coefficients between selling price per kg of watermelon (Rs) and the quantity (Kg) sold per day of watermelon farmers.

Variables	Selling price per kg of watermelon (Rs)	Quantity (Kg) sold per day
Selling price per kg of watermelon (Rs)	1	0.742
Quantity (Kg) sold per day	0.742	1

Table-5 reveals that selling price per kg of watermelon (Rs) is the independent variable whereas Quantity (Kg) sold per day is the dependent variable for the watermelon farmers. In the above table, selling price per kg of watermelon (Rs) and the quantity (Kg) sold per day correlation coefficient between of watermelon farmers is 0.742 which depicts there is a very high degree of positive correlation or strong positive association between selling price per kg of watermelon (Rs) and the quantity (Kg) sold per day of watermelon farmers.

Regression Analysis
Regression analysis is used to assess the strength of a relationship between one dependent variable and independent variables. It helps in predicting value of a dependent variable from one or more independent variables. Regression analysis helps in predicting how much variance is being accounted in a single response (dependent variable) by a set of independent variables. Here, the regression analysis is being used between selling price per kg of watermelon (Rs.) which is the independent variable and quantity (kg) of watermelon sold per day which is the dependent variable from 100 respondents of five sample study villages of Barkote block in Deogarh district of Odisha. Since here it has two variables so it is a case of bivariate regression. This particular regression analysis of these two variables is being analyzed with the help of SPSS Software advanced version of 20. For understanding the basic concept in Regression analysis, following is the equation for bivariate regression analysis as follows:
$Y = a+bX+e$, where Y is the Dependent variable, a is the intercept, b is the slope and X is the Independent variable/explanatory variable and e is the error or residual. After calculation the following regression equation is being obtained as follows:

$$Y = -0.076+0.568X$$

The whole summary output of Regression analysis for selling price per kg of watermelon (Rs.) and Quantity (kg) of watermelon sold per day is given in table-6

Table-6 Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.076	.577		-.132	.895	-1.222	1.069
	Selling Price per kg of Watermelon (Rs.)	.568	.052	.742	10.948	.000	.465	.671

a. Dependent Variable: Quantity (kg) of watermelon sold per day

Table -6 shows the Regression analysis model summary output using SPSS Software, where R value is 0.742 which tells us the correlation coefficients of selling price per kg of watermelon (Rs.) and quantity (kg) of watermelon sold per day. R Square tells us that we are able to explain 55% of variability of Y variable from X variable. To investigate if selling price per kg of watermelon (Rs.) has a significant impact on quantity (kg) of watermelon sold per day.

Hypothesis
H_1 is the hypothesis which tells us that there is a significant impact of selling price per kg of watermelon (Rs.) on quantity (kg) of watermelon sold per day. The following table shows the above summary of hypothesis in selling price and quantity sold in regression analysis.

Table-7: Hypothesis Summary of Regression Analysis

Hypothesis	Regression weights	Beta Coefficient	R^2	F	p-value	Hypothesis Supported
H_1	Selling Price→ Quantity Sold	0.568	0.550	119.863	0.000	Yes

From the Table-7, it shows the Hypothesis summary of regression analysis of selling price and quantity sold. The hypothesis tests the selling price per kg of watermelon (Rs.) as a significant impact on quantity (kg) of watermelon sold per day. The dependent variable quantity (kg) of watermelon sold per day was regressed on predicting variable selling price per kg of watermelon (Rs.) to test the hypothesis H_1. Selling price per kg of watermelon (Rs.) significantly predicted quantity (kg) of watermelon sold per day, F= 119.863, $p<0.001$, which indicates that the selling price can play a significant role in shaping quantity where Beta= 0 .568, $p<0.001$. These results clearly direct the positive effect of the selling price. Moreover, the $R^2 = 0.550$ depicts that the model explains 55% of the variance in quantity sold.

Cost-Benefit Analysis
Cost and Returns Analysis of Watermelon Production in the study areas of Deogarh district of Odisha. The results in Table 5 shows the estimate of cost and return analysis made from watermelon farming in 5 sample villages of Barkote block in the district. 100 respondents of the sample villages of the block are taken with reference to financial support given by NHM to undertake the project and investment made by it incurring all the costs and the benefits accrued by the farmers. Cost benefit analysis in any project tells us that which project to choose and if the venture yields positive returns or benefits from the total costs incurred then it is viable to go for investing in the project. So now we will find out the cost benefit analysis of the watermelon farming in the study areas of Barkote block in the district in the following table: The total cost incurred on watermelon production in the study areas was Rs. 25.20 lakhs and the gross benefits was Rs. 28.00 lakhs. The Net profit for watermelon farming was Rs. 2.80 lakhs, which depicts the difference between the total benefits/revenues and total cost. The benefit cost ratio for watermelon farming in the Deogarh district implies that watermelon farming is a profitable enterprise as the rule of thumb implies any benefit cost ratio greater than one, equal to one or less than one indicates profit, breakeven or loss, respectively. Since, the benefit cost ratio of this is greater than 1.0 and it shows that it is profitable even with little capital investment.

Table No.8: Cost Benefit Analysis: Watermelon production in Study Areas of Deogarh District of Odisha

Year	Costs (Rs. lakhs)	Benefits (Rs. lakhs)	Total Benefits (Rs. lakhs) (B-C)	Discount Factor rate@5%	Present Value (Rs. lakhs) (TB*DF)	BC Ratio (B/C)
2015	3.00	3.50	0.50	0.95	0.48	1.17
2016	3.20	3.50	0.30	2.10	0.63	1.09
2017	3.70	4.10	0.40	3.15	1.26	1.11
2018	4.30	4.80	0.50	4.20	2.10	1.12
2019	5.00	5.90	0.90	5.25	4.73	1.18
2020	6.00	6.20	0.20	6.30	1.26	1.03
				NPV	2.48	

Source: Secondary Data.

Table-8 indicates about the cost-benefit scenario which is mainly production-income of the watermelon farming from the sample villages of the study of Barkote block in the Deogarh district of Odisha. The watermelon farmers of the sample villages of the concerned block in the district have their own land of cultivation in the underdeveloped and tribal part of the district like Deogarh where farmers are beginners and having less capacity for investment. For this reason, help and financial aids are being provided by Govt. from various schemes from time to time. In this case, National Horticulture Mission provides financial aids in initial investment to the watermelon farmers. The cost benefit analysis of watermelon farming in the sample villages of the Barkote block in the district indicates that the initial investment on costs incurred like seeds cost, fertilizer cost, agro-chemicals, harvesting operation (labour per day), handling & transportation cost, weeding operation, planting operation and benefits or returns incurred like quantity sold per kg/ha, total revenue, net profit earned by the farmers through NHM and convergence of different schemes. From the above table, total benefits are being calculated by subtracting the benefits incurred to the costs incurred from years 2015- 2020. The discounting factor is @ 5% over 6 years. Also from the above table, the present value is calculated by multiplying the total benefits to discounting factor rate. The Benefit- Cost Ratio is just the ratio of benefits incurred to costs incurred. From the above table, it clearly indicates that in the year 2015, NHM with other convergence schemes have initially helped the watermelon farmers which incurred a cost of Rs.3.00 lakhs and simultaneously the benefits incurred is Rs.3.50 lakhs with a total benefits of Rs.50.000. In the year 2016, a cost of Rs.3.20 lakhs has been incurred with benefits of Rs.3.50 lakhs and with total benefits of Rs.30.000. In the year 2017, a cost of Rs.3.70 lakhs has been incurred with benefits of Rs.4.10 and with total benefits of Rs.40.000. In the year 2018, a cost of Rs.4.30 lakhs has been incurred with benefits of Rs.4.80 lakhs and with total benefits of Rs.50.000. In the year 2019, a cost of Rs.5.00 lakhs has been incurred with benefits of Rs.5.90 lakhs with total benefits of Rs.90.000. In the year 2020, a cost of Rs.6.00 lakhs has been incurred with benefits of Rs.6.20 lakhs with total benefits of Rs.20.000 due to non-transportation of the produce which is badly affected due to ongoing COVID pandemic. The Benefit-Cost Ratio of year 2019 is 1.18 which is higher than in compared to other years. So, it is clear that in that said year, the profit earned in the watermelon farming is higher in compared to other years. The Net Present Value (NPV) is being calculated by the following formula:

NPV= npv (Discount rate, Total benefits incurred from 2nd year to last year) + total benefits incurred from 1st year.

If the NPV is positive, then it is viable to stick with the venture. In this case, as the NPV is Rs.2.48 lakhs and positive so it is feasible to go for the venture although with marginal profits.

KEY FINDINGS OF THE STUDY

The present study is an area specific and agricultural product specific based on watermelon farmers only with an impact of NHM. Since this is an exhaustive study on watermelon farming conducted for the socio-economic impact analysis of NHM with convergence of other schemes in tribal dominated part of villages in Barkote block of Deogarh district of Odisha. Some of the key findings and survey response of the study are outlined below:

1) In Barkote block in Deogarh district, out of 100 respondents, 40% of the watermelon farmers sell their produce in an range of 0-1 kms from their home to selling point whereas 40% of the watermelon farmers sell their produce in an range of 1-2 kms and rest 20% of watermelon farmers sell their produce in an range of 2 and above kms.
2) In all the five sample study villages of Barkote block in Deogarh district, out of 100 respondents, 85% of them market their produce in local market and rest 15% through the help of cooperatives.
3) In all the five sample study villages of Barkote block in Deogarh district, out of 100 respondents, 85% of them have applied loan in the bank and rest 15% took loan from the federation/SHGs.
4) In all the five sample study villages of Barkote block in Deogarh district, out of 100 respondents, 85% of them have repaid their loan to the banks whereas rest 15% of them have repaid their loan to the federations/SHGs.
5) Level of education and caste of the farmers were reported having no significant relationship with the yield of the crop and watermelon has come up as a major horticultural crop in the district since the last decade contributing a lot to its agro-economy.

SUGGESTIONS & POLICY IMPLICATIONS

1. If bank credit to the watermelon farmers will be provided at the right time, then it would be benefited much in the sample study villages of Barkote block in Deogarh district of Odisha.
2. If the review of progress of watermelon framers on production and productivity is done timely, then the reports can be supplied to the Government in order to follow up further necessary actions in the sample villages of the concerned block in Deogarh district.
3. Building awareness, providing quality planting material, providing technical support to the watermelon farmers in the study areas of Deogarh district can be of very much useful in taking up the venture and sustainability of the enterprise to future.
4. There is need to improve marketing infrastructure and more convergence programmes with the aid of government as well as more livelihood projects with noted NGOs can bring more dividends to the watermelon farmers in the sample villages of Barkote block in Deogarh district.
5. The focus needs to be increased on post harvest management and market linkages would ameliorate the sufferings of the watermelon farmers in the sample villages of Barkote block in Deogarh district of Odisha.
6. NHM suggested that government and donor agencies should encourages farm households providing them with the modern agricultural inputs so as to influence them to participate fully into watermelon production irrespective of their Socio-economic differences
7. It is recommended that farm households should participate fully in watermelon production so as to carter for their needs in the sample villages of Barkote block in Deogarh district of Odisha.
8. It is recommended that government should provide alternative sources of income so as to influence participation of farm households into watermelon production in the sample villages of Barkote block in Deogarh district of Odisha.
9. It is recommended that watermelon processing and storage technologies should be put in place, so as to avoid the incidence of losses of watermelon farmers in the sample villages of Barkote block in Deogarh district of Odisha.
10. It is recommended that government and nongovernmental agencies should stimulate more participation in watermelon production in the sample villages of Barkote block in Deogarh district by providing trained agricultural extension staffs.
11. It is also recommended that linking the watermelon farmers with organised retailers like Reliance Fresh, Mother Diary, Natraj Foods and nearby Big Bazaars or small shopping malls for procurement of watermelons would be beneficial which will eradicate the transportation bottlenecks.

CONCLUSION

Watermelon cultivation has come up as a viable enterprise in the tribal dominated villages of Barkote block of hilly deogarh district of Odisha state. Village youths have adopted this enterprise commercially and made it a viable, prestigious, self-employed agro-based profession by selling the produce in local areas of the district. The horizontal and vertical growth of this commercial crop has opened up a new dimension of profitable farming in the plateau eco-system of Odisha. It values much for the socioeconomic development and livelihood support for the inhabitants of such an under developed district. Farmers of other districts coming under this plateau eco-system are also started cultivating which increases the cropping intensity and strengthens the agro-entrepreneurship in the state. Government should provide instant crop insurance coverage, credit facilities, and explore the possibilities of processing industries as an initiation of confidence building measures (CBMs) among the watermelon farmers.

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