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RESEARCH ARTICLE

A study on the economic impact assessment of chili variety Kashi Anmol

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Abstract

ICAR-Indian Institute of Vegetable Research, Varanasi, developed a chili variety 'Kashi Anmol' in 2006. This variety has been widely adopted and cultivated by farmers in different parts of the country. The present study helps in estimating the economic surplus generated as a consequence of research outputs for the development of chili variety 'Kashi Anmol'. The approximate spread of area under Kashi Anmol variety was estimated at 163695.95 ha during 2005-06 to 2021-22, covering a total of 165 districts in 26 states. The Average chili area in the Country was 391667 ha during TE 2020-21. The annual average area under the Kashi Anmol variety of chili in the Country was 9629.17 ha per annum. The estimated results of the economic surplus model (ESM) showed that there was a producer surplus of Rs. 11.94 crores, consumer surplus of Rs. 18.94 crores, and total economic surplus of Rs. 30.88 crores generated from the variety. The Net Present Value (NPV) generated was Rs. 30.50 crores, Net Present Benefit (NPB) was Rs. 30.88 crores and net present cost (NPC) was Rs. 38 Lakhs. The Internal Rate of Return (IRR) was 79% and benefit cost ratio (BCR) 81.22 in the present technology. The total cost of cultivation of the Kashi Anmol variety of chili was Rs. 221529 per hectare, compared to Rs. 226139 per hectare of the local variety. The net return in Kashi Anmol variety of chili was Rs. 277971 per hectare, while it was Rs. 213261 per hectare in the local variety of chili. The BC ratio was 2.26 and 1.94 for Kashi Anmol variety and local variety of chili. The monetary value of break-even output estimated to Rs. 56865.32 for Kashi Anmol variety while it was Rs. 62814.76 for local variety. The present study indicates that the investments made for the development of Kashi Anmol variety of chili was highly economical and provided evidence to the policy makers that supporting the research investment for the same.

Keywords: Economic impact assessment, Chili, Kashi Anmol, IIVR Varanasi

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Introduction

Vegetables are most important constituents of Indian agriculture and nutritional security due to their high yield, short duration, economic viability, healthful richness and creating on-farm and off-farm employment. New vegetable varieties /hybrids and technological interventions have given tremendous boost to vegetable production. The vegetable production in India has touched a new height in recent years. Vegetables contributed an estimated area of 11.31 million hectares with a production of 212.55 million tonnes and productivity of 18.80 tonnes per hectare during the year 2022-23 (DoA&FW, 2024) is the second biggest producer of vegetables in the world next to China. The ten major vegetables *i.e.* Potato (28.02%), onion (13.29%), tomato (10.57%), brinjal (6.42%), cabbage (4.77%), cauliflower (4.60%), tapioca (3.46%), okra (3.23%), pea (2.92%) and green chilies (2.18%) constituting around 80 percent of the total vegetable production in the country. Experiences gained in developing countries recommend that diversification of agriculture towards high-value crops helps small landholders to increase their incomes and bail them out

from the vicious circle of poverty (Ryan & Spencer, 2001). Further, planned development in vegetable production not only improves the nutritional requirement but could also meet the challenge of adequate food supply to the growing population in India (Samantaray *et al*., 2009). Ali and Tsou, 1997 reported that on the food demand side, the emphasis is now shifting from basic nutrients (i.e., calories and protein) to balanced diets (calories, protein, and micronutrients) and these changes resulted in diversification of agriculture from crop production towards vegetable production in the country.

Chili is one of the major commercial vegetable crops that increase the income of rural people with creating employment opportunity and improvement in living standard. In India, vegetable in general and chili in particular is majorly grown by small and marginal farmers for whom it is an important source of income. Chili occupies an important place in Indian diet and it is consumed daily in one or the other forms. There are more than 400 varieties of chili found all over the world. India is most popular for chili production because it has immense potential to grow due to best suited climate, soil, irrigation facilities, skill and experience of the farmers (Geetha and Selvarani, 2017). Chili contains high amount of vitamin C and other vitamins such as vitamin A, vitamin B_6, vitamin K and minerals like calcium, magnesium, folate, potassium, thiamin, iron, copper etc. Capsaicin is the main bio-active compound in chili which is responsible for its pungent taste and various health benefits (Chakrabarty *et al*., 2015). It is also rich and economical vegetable that contains an appreciable amount of essential micro and macronutrients that are nutritionally valuable and also contain healthy ingredients to promote health. The presence of phytochemicals and antioxidants is also important in the prevention of chronic diseases (Olatunji and Afolayan, 2018).

Chili crop is produced in tropical and sub-tropical regions and requires a warm humid climate (Ramachandra *et al*., 2012). The World production of chili was 36.14 million tonnes from an area of 2.07 million hectares, with a productivity of 17.46 tonnes/ hectares during the year 2020. China is the leader in chili production at the global level with a 46.15% share (16.68 million tonnes from an area of 0.74 million hectares with the productivity of 22.54 tonnes/hectare) in total production (FAO, 2022). The area, production and productivity of chili in India during the year 2022-23 were about 413 thousand hectares, 4496 thousand tonnes and 10.89 tonnes/ha, respectively. The state of Madhya Pradesh is the leading producer of chili with a total production share 22.01% followed by Karnataka (13.69% share), Bihar (10.70%), Andhra Pradesh (10.01%) and Tamil Nadu (9.09%) (DoA&FW, 2024). The efficient resource allocation under scarce resources and the necessity to justify their use to society require the assessment of the economic impacts of research. Economic analysis is helpful to know the social value of scientific knowledge and technologies and to make judgments about the trade-offs in the allocation of scarce resources in research (Alston *et al*., 1995). Economic impact assessment of new technologies delivers helpful information to justify investment efforts in research and development to generate new technologies (Wander *et al*., 2004). Assessment of the economic impacts of technology delivered helpful information to justify investment efforts in research and development to generate new technologies (Masters *et al*., 1996).

An attempt was made in this paper to study the research investment for the development of the Kashi Anmol variety of chili, which generates economic returns to society. The present study was an ex-post assessment done, which is based on the economic surplus approach. The study helps in estimating the economic surplus generated as a consequence of research outputs. The information derived through the economic surplus approach is used to estimate the benefit-cost ratio (BCR), internal rate of return (IRR), and net present value (NPV) of research outputs. Break-even analysis has also been made by computing the break-even point (BEP). Thus, the present study aims to contribute the discussion on the benefits of Kashi Anmol variety of chili in terms of yield gain, reduction in cost, and monetary benefits to producers, consumers and society.

Salient features of the chili variety 'Kashi Anmol'

ICAR-Indian Institute of Vegetable Research, Varanasi, developed a chili variety 'Kashi Anmol' in 2006. This variety was recommended for release and cultivation in the states of Punjab, Uttar Pradesh and Jharkhand. This variety is an improved population derived from two cycles of simple recurrent selection from a Sri Lankan introduction. Plants are determinate, dwarf (60-70 cm) with nodal pigmentation on the stem and bear green, attractive pendant fruits. First picking starts at 55 days after transplanting, with a yield of 200 q/ha in only 120 days of crop duration. Most suitable for the growers taking wheat during rabi season (Singh *et al.,* 2016). With all these qualitative and yield advantages, the variety was released by the Institute, which was widely adopted and cultivated by a large number of farmers all over the country. Hence, an attempt has been made to estimate the ex-post economic impact of the chili variety Kashi Anmol.

Materials and Methods

Estimated area under the variety

The area coverage of the variety was estimated using the quantity of seed sale data from the ICAR-IIVR seed sale center. The quantity of truthfully labelled seeds sold to farmers, different Government and private agencies was collected from the ICAR-IIVR seed sale center. The approximate area

under the variety was estimated considering the seed rate of 0.60 Kg/ha. The data on the quantity of breeder seeds sold to different Government and private agencies were collected and further the conversion of breeder seeds to foundation seeds and then to certified seeds was estimated considering the average yield loss (due to biotic and abiotic factors) and seed multiplication ratio of 1:200. The Seed Multiplication Ratio gives the seed yield in kilogram obtained from 1 kg of seed sown.

Economic surplus model (ESM)

The economic surplus model given by Alston et al. (1995) is generally used to assess the returns on investments made in the research by analyzing the changes in consumer and producer surplus. A closed economy with a parallel supply shift was the assumption made (Fig. 1).

Total economic surplus was calculated using the following equations,

Change in producer surplus:

$\Delta PS = Po * Qo * (K - Z) * (1 + 0.5Z\eta)$ Change in consumer surplus:

$\Delta CS = Po * Qo * Z * (1 + 0.5Z\eta)$

Change in total economic surplus:

$$ES = \Delta TS = \Delta CS + \Delta PS = Po * Qo * K * (1 + 0.5Z\eta)$$

Where,

P_o = Base price of the commodity

Q_o = Base quantity

η = Absolute value of the price elasticity of demand

Z = K ε/ (ε+η) or the proportionate price reduction in the market, where ε is the elasticity of supply

Kt = Proportionate reduction in cost per ton of production in time t or research induced shift in supply which is given by,

$$K_t = \left(\frac{E(Y)}{\varepsilon}\right) - \left(\frac{E(C)}{1 + E(Y)}\right) A t (1 - \Delta)^t$$

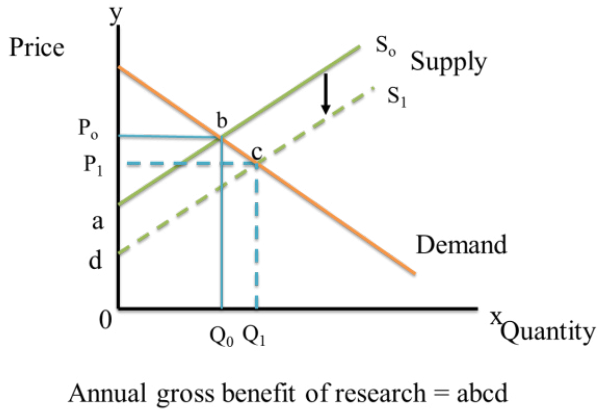

Fig 1: Impact of research on varietal development

Where,

E(Y) = Proportionate yield increase per ha for technology adopters

E = Price elasticity of supply

E(C) = Proportionate variable input cost change per ha

A = Proportion of the area under the technology

Δ = Rate of depreciation of technology

The economic impact of the investments made on the research of varietal development was conducted ex-post, i.e., after the variety was adopted and cultivated by the farmers. Various secondary and primary sources of data are required for the analysis in the economic surplus model, which has been discussed below.

Change in yield and cost of cultivation

Primary data from 30 farmers across 3 different villages of Varanasi and Mirzapur Districts, Uttar Pradesh, were collected by personal interview through pre-tested questionnaires. The data on cost of cultivation, yield, and returns from the farmers who adopted the technology, i.e., growing Kashi Anmol variety, and the farmers who did not adopt the technology and were growing the local variety of the crop, or both, were collected for comparison. The cost of cultivation, gross return, net returns, cost of production, and BC ratio were calculated for both the Kashi Anmol variety of chili and the local variety grown in the area. The yield change compared to the local variety grown was estimated to be 9.47%. The input cost reduced in Kashi Anmol variety of chili compared to the local variety was estimated to be around 2.04%.

Elasticity of demand and supply

The demand elasticity of different agricultural commodities, as estimated by Kumar et al. (2011), in which the demand elasticity for vegetables (-0.515) was obtained. Estimates for price elasticities of supply could not be found in the recent literature for chili. Therefore, we follow Kumar *et al.* (2011) and use a price elasticity of vegetable supply of 0.817 for chili also.

Rate of adoption of the technology

The adoption rate of the technology was assessed by discussion with stakeholders involved in the popularization of the variety to estimate the economic surplus over the period of time. The research & development of the variety started in 1997 and the variety was released in 2006.

Production and wholesale price

The production estimates were calculated using the estimated area under the variety. The average wholesale prices of chili was collected from 2006 to 2021 from https://agmarknet.gov.in/ and then converted to the real prices by deflating the figures using the wholesale price index for chili for the same period collected from Office of the Economic Adviser, Ministry of Commerce & Industry.

Probability of success

It ranged from 0 to 1. Keeping in view the advantages of growing this variety by farmers, the probability of success was fixed at 0.8.

Depreciation factor of the technology

It means the rate at which the technology depreciates. The depreciation rate of the technology was considered ranging from 1 to 0.7 over the period.

Cost Benefit analysis

A profitability analysis was carried out to show the economic viability of the research using economic surplus model. The most common used parameters such as net present value (NPV), net present benefit (NPB), net present cost (NPC), internal rate of return (IRR) and benefit cost ratio (BCR) were estimated. The discount rate considered was 10% to calculate NPV.

Net present value (NPV):

$$\sum_{t=0}^{n}[(B_t - C_t)/(1+r)^t]$$

Internal rate of return (IRR):

$$\sum_{t=0}^{n}[(B_t - C_t)/(1+IRR)^t] = 0$$

Benefit cost ratio (BCR):

$$\sum_{t=0}^{n}[(B_t)/(1+r)^t] / \sum_{t=0}^{n}[(C_t)/(1+r)^t]$$

Where, B_t is benefit (changes in total surplus) in year t, C_t is cost in year t and r is the discount rate.

Cost and return analysis

The cultivation cost was worked out by using various cost concepts defined below:

Cost A1 = All the variable costs excluding family labor cost and including interest on working capital

Cost A2 = Cost A1 + Rent paid for leased in land

Cost B1 = Cost A1 + Interest on value of owned fixed capital (other than land)

Cost B2 = Cost B1 + Rental value of owned land + Rent paid for leased in land

Cost C1 = Cost B1 + Imputed value of family labor

Cost C2 = Cost B2 + Imputed value of family labor

The net return over the cost concepts have been calculated as the difference between the gross farm income (GFI) and particular cost.

GFI = Value of main product (Quantity * Price)

Net return including family labor = GFI – total cost including family labor

Net return excluding family labor = GFI – total cost excluding family labor

Farm business income = GFI – Cost A2

Family labor income = GFI – Cost B2

Net Farm Income = GFI – Cost C2

Farm investment income = Farm business income – imputed value of family labor

Partial Budget Analysis (PBA)

When a farmer observes a change in the use of technology, Partial Budget Analysis can be used to analyze the expected costs and benefits of the new technology. Partial budgeting is a statement of anticipated changes in costs, returns and profits. The varieties/technique involve only those factors that are changed. It does not consider the farm resources that are left unchanged. The capability of the changes in the farm business was evaluated for its incremental effects in a partial budget analysis. In the present study, the cost and returns of existing cultivated variety of chili compared with the Kashi Anmol variety of chili. In developing partial budgets, the costs (debit side) and benefits (credit side) due to adoption of new variety were estimated. The elements of a partial budget are added or reduced costs and added or reduced returns. A positive change in the net benefit indicates the beneficial technological change.

Credit = Increase in return + Decrease in cost

Debit = Increase in cost + Decrease in return

Net Benefit = Credit - Debit

Break-even point analysis

Break-even analysis has been made by computing the break-even point (BEP) or the volume of produce that generates returns just equal to the cost of production.

$$\text{BEP} = \frac{F}{(P-V)}$$

We computed the monetary value of the break-even point.

BEP = F / [1-(V/P)]

Where,

F = Fixed costs in Rs. per hectare

P = Price of product (per quintal in Rs.)

V = Variable costs (per quintal in Rs.)

Results and Discussion

Estimated area coverage under the cultivation of Kashi Anmol variety

Total quantity of seed sale and the estimated area under Kashi Anmol variety of chili have been presented in Table 1. The approximate spread of area under Kashi Anmol variety was estimated at 163695.95 ha during 2005-06 to 2021-22 covering a total of 165 districts in 26 states (calculated from the sale of both TL and breeder seeds data).

Table 1: Total quantity of seed sale and the estimated area under Kashi Anmol variety

S. No.	*Particulars*	*Period (Years)*	*Total Seeds (kg)*	*Estimated area (ha)*
1	Total TL seed sale from IIVR to farmers and different Government / private agencies	2005-06 to 2021-22	1737.57	2895.95
2	Total breeder seed sale from IIVR, Varanasi to different Government /private agencies	2010-11 to 2019-20	6.70	-
3	Estimated quantity of foundation seeds produced from breeder seeds	2011-12 to 2020-21	804.00	-
4	Estimated quantity of certified seeds produced from foundation seeds	2012-13 to 2021-22	96480.00	160800.00
Total		2005-06 to 2021-22	98217.57	163695.95

During 2005-06 to 2021-22 (17 years) Spread of variety covering a total of 165 districts in 26 states

Area coverage under chili and Kashi Anmol variety has been presented in Table 2. The Average chili area in the Country was 391667 ha. during TE 2020-21. The annual average area under Kashi Anmol variety of chili in the Country was 9629.17 ha. and it was around 2.46% of total chili area in the country.

Results of economic impact assessment of Kashi Anmol using Economic surplus model have been presented in Table 3. The cost of the technology of Kashi Anmol variety of tomato was calculated by the salaries of the scientific, technical personnel and other man power involved in the research, development and extension of the technology according to their per cent time contribution. Besides, laboratory and chemical cost, cost of field trails and multi-location trials, extension cost, cost of seed production and storage and Institutional charges at 10% was included. The estimated results of economic surplus model (ESM) showed that there was producer surplus of Rs. 11.94 crores, consumer surplus of Rs. 18.94 crores and total economic surplus of Rs. 30.88 crores generated from the variety. The Net Present Value (NPV) generated was Rs. 30.50 crores, Net Present Benefit (NPB) was Rs. 30.88 crores and Net Present Cost (NPC) was Rs. 38 Lakhs. The Internal Rate of Return (IRR) was 79% and Benefit Cost Ratio (BCR) 81.22 in the present technology. The share of producer and consumer surplus in total surplus was 39: 61. The Kashi Anmol variety has earned Rs. 0.50 lakh under commercialization to one private seed companies as registration fees paid to the Institute.

Cost of cultivation and net returns

The total cost of cultivation and returns in chili cultivation have been presented in Table 4 and 5. The total cost of

Table 2: Area coverage in the Country

S. No.	*Particulars*	*Details*
1	Average green chili area in the Country (TE 2020-21)	391667.00 ha.
2	Average area under Kashi Anmol variety of chili in the Country	9629.17 ha.
3	Kashi Anmol average area in relation to green chili area in the Country	2.46%

Table 3: Economic impact assessment of Kashi Anmol using Economic surplus model

S. No.	*Cost Benefit Analysis (Rs. crores)*	
1	Net Present Value (NPV)	30.50
2	Net Present Benefit (NPB)	30.88
3	Net Present Cost (NPC)	0.38
4	Internal Rate of Return (IRR)	79 %
5	Benefit Cost Ratio (BCR)	81.22
Distribution of Economic Surplus (Rs. crores)		
6	Producer surplus	11.94
7	Consumer surplus	18.94
8	Total Economic surplus	30.88

Table 4: Total cost of cultivation in chili (Rs./ha.)

Particulars	*Kashi anmol*	*Local variety*
Variable costs		
Land preparation	9867	9733
Manure	7067	6933
Seeds	1080	1417
Fertilizers	19866	21602
Irrigation	9700	10433
Plant protection chemicals	31866	32800
Human labor (all operations)	82000	84000
Growth hormone & micronutrient	5965	6250
Marketing cost	13875	12750
Interest on working capital	4532	4649
Total variable cost	185818	190567
Fixed cost		
Rental value of land	34000	34000
Depreciation on implements	489	449
Interest on fixed capital	1222	1123
Total fixed cost	35711	35572
Total cost of cultivation	221529	226139

Table 5: Returns in chili cultivation (Rs./ha.)

Particulars	*Kashi anmol*	*Local variety*
Average yield (quintal/ha.)	185	169
Average price (Rs./Q)	2700	2600
Gross returns	499500	439400
Cost of cultivation	221529	226139
Net returns	277971	213261
BC Ratio	2.26	1.94
Cost of production (Rs. per kg.)	11.98	13.38

Table 6: Costs in chili production according to cost concept (Rs./ha)

S. No.	*Items*	*Kashi anmol*	*Local variety*
Cost concepts			
1	Cost A_1	128418	131767
2	Cost A_2	138618	141967
3	Cost B_1	130129	133339
4	Cost B_2	164129	167339
5	Cost C_1	187529	192139
6	Cost C_2	221529	226139

Table 7: Break-even output (BEP) in chili cultivation (Rs./ha)

Particulars	*Kashi anmol*	*Local variety*
Fixed cost (Rs./ha.)	35711	35572
Variable cost (Rs./Quintal)	1004.42	1127.62
Average price (Rs.)	2700	2600
Break-even output (Quintal/ha.)	21.06	24.16
BEP in monetary value (Rs./ha.)	56865.32	62814.76

cultivation of Kashi Anmol variety of chili was Rs. 221529 per hectare compared to Rs. 226139 per hectare of local variety. The total variable cost in Kashi Anmol variety of chili was Rs. 185818 per hectare compared to Rs. 190567 per hectare of local variety. The share of fixed and variable cost in Kashi Anmol variety of chili was 16:84 in total cost of cultivation. The cost on seed, fertilizers, plant protection chemicals, human labor etc. mainly contributed to the reduction in cost of Kashi Anmol variety of chili production.

The net return in Kashi Anmol variety of chili was Rs. 277971 per hectare while it was Rs. 213261 per hectare in local variety of chili. Cost of production for Kashi Anmol variety of chili was Rs. 11.98 per kg., while it was Rs. 13.38 per kg. in local variety of chili. The BC ratio was 2.26 and 1.94 for Kashi Anmol variety and local variety of chili grown by the farmers.

Cost of cultivation according to various cost concepts has been presented in Table 6 which reveals that all the costs were higher in cultivation of local variety of chili over Kashi Anmol variety of chili. The cost A_1 was higher by around 2.61% in cultivation of local variety of chili over Kashi Anmol variety of chili. Similarly, the cost C_2 was higher by around 2.08% in cultivation of local variety of chili over Kashi Anmol variety of chili.

Break-even analysis

Break-even output (BEP) in chili cultivation has been presented in Table 7. Break-even output in Kashi Anmol variety of chili estimated to 21.06 quintal per hectare while it was 24.16 quintal per hectare for local variety. The monetary value of break-even output estimated to Rs. 56865.32 for Kashi Anmol variety while it was Rs. 62814.76 for local variety.

Economic impact using partial budgeting

The costs reduction and additional returns incurred in the Kashi Anmol variety of chili production over local variety has been presented in Table 8. Table reveals that the increment in profit realization in Kashi Anmol variety of chili production was Rs. 64710/ha. The cost on seed, fertilizers, plant protection chemicals, human labor etc. mainly contributed to the reduction in cost of Kashi Anmol variety of chili production. The added return in Kashi Anmol variety of chili production was attributed mainly through the increased productivity and higher price realization over

Table 8: Economic impact of Kashi Anmol variety of chili using partial budgeting (Rs. per ha.)

Debit		*Amount (Rs.)*	*Credit*		*Amount (Rs.)*
A	Increase in cost		A	Decrease in cost	
i	Transportation	1125	i	Seed	337
ii	Others	407	ii	Fertilizers	1736
			iii	Plant protection chemicals	934
			iv	Human labor	2000
			v	Others	1135
	Total	1532		Total	6142
B	Decrease in return	0	B	Increase in return	60100
Total Debit		1532	Total credit		66242
Profit			64710		

local variety. It can be concluded from the partial budgeting analysis that the adoption of Kashi Anmol variety of chili production technology would provide an additional profit to the farmers. We reported similar studies in tomato variety Kashi Aman (Pal et al. 2023).

Conclusion

Kashi Anmol variety of chili has many advantages over the local varieties. The approximate spread of area under Kashi Anmol variety was estimated at 163695.95 ha during 2005-06 to 2021-22 covering a total of 165 districts in 26 states. The total cost of cultivation of Kashi Anmol variety of chili was Rs. 221529 per hectare compared to Rs. 226139 per hectare of local variety. The share of fixed and variable cost in Kashi Anmol variety of chili was 16:84 in total cost of cultivation. The net return in Kashi Anmol variety of chili was Rs. 277971 per hectare which is higher than the local variety of chili. The BC ratio was 2.26 and 1.94 for Kashi Anmol variety and local variety of chili grown by the farmers. The total economic surplus generated due to Kashi Anmol variety of chili was 30.88 crores adopted and grown in different parts of the country. Break-even output in Kashi Anmol variety of chili estimated to 21.06 quintal per hectare while it was 24.16 quintal per hectare for local variety. Adoption of Kashi Anmol variety of chili production provides gains to both producer and consumers. The present study indicates that the investments made for the development of Kashi Anmol variety of chili was highly economical.

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सारांश

भा.कृ.अनु.प.- भारतीय सब्जी अनुसंधान संस्थान, वाराणसी द्वारा वर्श 2006 में मिर्च की नई किस्म 'काषी अनमोलञ का विकास किया गया। यह किस्म देष के विभिन्न हिस्सों में किसानो द्वारा व्यापक रूप से स्वीकार्य की गयी व इसकी खेती की जाती है। वर्तमान अध्ययन मिर्च की 'काषी अनमोलञ किस्म के विकास के परिणाम स्वरूप उत्पन्न आर्थिक अधिषेश का अनुमान लगाने में मदद करता है। वर्श 2005-06 से 2021-22 के दौरान 'काषी अनमोलञ किस्म के तहत कुल अनुमानित क्षेत्रफल 163695.95 हेक्टेअर था जो कि 26 राज्यों के 165 जिलों में फैला हुआ था। देष में मिर्च के अन्तर्गत औसत वार्शिक क्षेत्रफल (त्रिवार्शिक समापन 2020-21) 391667 हेक्टेअर था एवं देष में काषी अनमोल के अन्तर्गत औसत वार्शिक क्षेत्रफल 9629.17 हेक्टेअर था। आर्थिक अधिषेश मॉडल के आधार पर उत्पादक अधिषेश रू. 11.94 करोड़, उपभोक्ता अधिषेश रू.18.94 करोड़ एवं कुल आर्थिक अधिषेश रू. 30.88 करोड़ था। षुद्ध वर्तमान मूल्य रू. 30.50 करोड़ एवं षुद्ध वर्तमान लाभ रू. 30.88 करोड़ था। वर्तमान तकनीकी में रिटर्न की आन्तरिक दर 79 प्रतिषत एवं लाभ-लागत अनुपात 81.22 था। मिर्च की 'काषी अनमोलञ किस्म में खेती की कुल लागत रू. 221529 प्रति हेक्टेअर थी जबकि स्थानीय किस्म में यह रू. 226139 प्रति हेक्टेअर थी। 'काषी अनमोलञ किस्म की खेती में षुद्ध लाभ रू. 277971 प्रति हेक्टेअर था जबकि स्थानीय किस्म में यह रू. 213261 प्रति हेक्टेअर था। 'काषी अनमोलञ एवं स्थानीय किस्म में लाभ-लागत अनुपात 2.26 एवं 1.94 था। 'काषी अनमोलञ किस्म के लिए ब्रेकμईवेन उत्पादन का मौद्रिक मूल्य लगभग रू. 56865.32 था जबकि स्थानीय किस्म के लिए यह रू. 62814.76 था। वर्तमान अध्ययन इंगित करता है कि मिर्च की 'काषी अनमोलञ किस्म के विकास में किया गया निवेष किफायती था साथ ही यह नीति निर्माताओं को अनुसंधान निवेष के समर्थन का प्रमाण प्रदान करता है।