

**RESEARCH ARTICLE :**

SWOC anlysis of tomato cultivation in Chittoor district of Andhra Pradesh

■ K. MADHURI, V. SAILAJA, P. V. SATHYA GOPAL AND D. SUBRAMANYAM

ARTICLE CHRONICLE :**Received :**

11.07.2017;

Accepted :

26.07.2017

SUMMARY : SWOC as an acronym which represents strengths, weaknesses, opportunities and challenges of an organization, programme and project. SWOC analysis was applied to unearh the strengths, weaknesses, opportunities and challenges of tomato cultivation as perceived by the 120 respondents selected from chittoor district of Andhra Pradesh. Higher net income, requires less number of irrigations and better price in the market were the major strengths of tomato cultivation. Weaknesses include price instability, whole salers and retailers role in price fixation and non-availability of labour. Opportunities in tomato cultivation were facilitates for strengthening public and private partnership in agriculture, provision of storage facilities and opportunities to set up processing industries. Non-availability of seed in time, weak management information system and labour migration to nearby towns/cities were the challenges as perceived by the respondents.

KEY WORDS :

Tomato,
SWOC,
RBQ

How to cite this article : Madhuri, K., Sailaja,V., Gopal, P.V. Sathya and Subramanyam, D. (2017). SWOC anlysis of tomato cultivation in Chittoor district of Andhra Pradesh. *Agric. Update*, **12** (TECHSEAR-4): 972-977; DOI: 10.15740/HAS/AU/12.TECHSEAR (4)2017/972-977.

BACKGROUND AND OBJECTIVES

Tomato is a fruit that is almost universally treated as a vegetable and a perennial plant that is almost universally as an annual. Tomato is well known and very popular vegetable grown successfully throughout India. Tomato ranks third in priority after potato and onion in India but ranks second after potato in the world. India ranks second in the area as well as in production of tomato. Andhra Pradesh is producing about 36% of tomatoes in the country and is the leading producer of tomato involving a production of 1473.5 thousand million tones from an area of 54.2 thousand hectares with productivity of 27.2 mt/ha. In

view of the magnitude of the area under tomato cultivation, the large number of farmers who are cultivating tomato impending problems, it is most appropriate to undertake a SWOC analysis for sustainability of tomato cultivation by analyzing what are the strengths, weaknesses, opportunities and challenges in tomato cultivation. This analysis is expected to highlight the points for an in depth understanding of the situation in its totality, which in turn helps the top administrators, planners of state government, scientists to take strategic decision to overcome the weaknesses and challenges in tomato cultivation. To acquire proper insights in to the

Author for correspondence :**K. MADHURI**

Department of
Agricultural Extension
S.V. Agricultural College
(A.N.G.R.A.U.), TIRUPATI
(A.P.) INDIA
Email:madhurireddykogara
@gmail.com

See end of the article for
authors' affiliations

identification of strengths, weaknesses, opportunities and challenges of tomato cultivation an attempt has been made in the investigation.

RESOURCES AND METHODS

Exploratory design was followed. Chittoor district of Andhra Pradesh, three mandals namely Kurabalakota, Molakalacheruvu and Gurramkonda of Chittoor district, four villages from each mandal were selected for the study. From each village 10 farmers were selected thus a total number of 120 respondents were selected from 12 villages. A schedule was prepared to unearth the SWOC of tomato cultivation. The perceived responses of the farmers under each parameter were listed. Ten important strengths, weaknesses, opportunities and challenges were identified by applying Rank Based Quotient (RBQ) developed by Sabaratnam (1998). The data obtained from the farmers regarding strengths, weaknesses, opportunities and challenge parameters in tomato cultivation was quantified *i.e.* The number of farmers who gave the particular rank were used for calculation of RBQ

The formula for RBQ calculation is as follows:

$$RBQ = \frac{(f_i)(n+1-1) \times 100}{Nn}$$

where,

f_i = Frequency of farmers for *i*th rank of SWOC parameters

N= Number of farmers

n = Number of ranks.

OBSERVATIONS AND ANALYSIS

In order to understand the nature of the strengths,

weaknesses, opportunities and challenges of tomato cultivation as perceived by the tomato farmers rank based quotients were computed and the values had been presented in Table 1 to 4.

Strengths of tomato cultivation based on RBQ estimation :

From the Table 1 it was clear that the ten important strengths of tomato cultivation as perceived by the tomato growers like getting higher income (84.91%), followed by requires less number of irrigations (81.90%), significant yield increase(80.16%), staking provides support to the growing plant (74.50%), better price in the market (71.32%), availability of HYV and disease resistant varieties (50.74%), easy accessibility to market (31.33%), demand during off season (26.9%), cultivation is low (25.50%), high demand for the value added tomato products in the market (22.33%).

Weaknesses of tomato cultivation based on RBQ estimation :

From the Table 2 it could be observed that important ten weaknesses in tomato cultivation, which were ranked by the tomato farmers identified based on rank based quotients and placed in order which include: price instability (91.34%) followed by whole salers and retailers role in price fixation (90.00%), higher hiring charges of the transport vehicles(86.17%), non-availability of labour(75.84%), high cost of plant protection chemicals (75.50%), less bargaining power of farmers (67.84%), lack of planning about tomato production (67.00%), Lack of direct farmer access to retailers and super markets (66.34%), lack of market information resources (58.67%) and micro nutrient deficiencies (35.58%).

Table 1: Strengths of tomato cultivation as perceived by the farmers

Sr. No.	Strengths	Ranks										RBQ	Rank
		I	II	III	IV	V	VI	VII	VIII	IX	X		
1.	Higher net income	34	29	26	24	7						84.91	I
2.	Requires less number of irrigations	31	26	21	19	23						81.9	II
3.	Significant yield increase	27	24	21	20	28						80.16	III
4.	Staking provides support to the growing plant	17	21	19	22	24	17					74.50	IV
5.	Better price in the market	11	20	21	19	20	29					71.32	V
6.	Availability of HYV and disease resistant varieties			12	16	18	21	29	24			50.74	VI
7.	Easy accessibility to market						27	25	23	27	18	31.33	VII
8.	Demand during off -season						14	23	25	28	30	26.9	VIII
9.	Cost of cultivation is low						12	22	24	28	30	25.5	IX
10.	High demand for the value added tomato products in the market							21	24	37	38	22.33	X

Opportunities of tomato cultivation based on RBQ estimation :

From the Table 3 it could be observed that important ten opportunities in tomato cultivation, which were ranked by the tomato farmers identified based on rank based quotients and placed in order which include: facilitates for strengthening of public and private partnership in agriculture (86.58%) followed by provision of storage facilities (84.33%) opportunities to set up processing industries (81.83%), build the capacities of the farmers on post harvest techniques *i.e.*, grading, sorting, packaging etc. (74.31%), developed organized tomato marketing systems in the main production centres (58.74%), provision of government support for market integration and agro-enterprise development (51.74%), raise in export prices to achieve higher margins in current and future export markets by enhancing quality (37.08%), favourable climate (36.16%), requires no skilled labour (23.81%) and contact farming initiatives which needs to be encouraged through supportive policies (15.58%).

Challenges of tomato cultivation :

From the Table 3 it could be observed that important ten challenges in tomato cultivation, which were ranked by the tomato farmers identified based on rank based quotients and placed in order which include: Non-availability of seed in time (87.08%), weak management system (85.99%), labour migration to nearby cities/towns (82.24%), farmers do not have their own transport to deliver the product to the market (77.25%), high cost of chemical fertilizers (62.32%), frequent price slashes due to changes in export policies or unregulated domestic

markets (39.16%), lack of co-ordination between ministry of agriculture and other departments (27.49%), lack of extension and advisory services in tomato marketing (26.56%) cash payments not received in time (26.24%) malpractices of merchants in the mandies such as deduction of unauthorized market charges, unfair weighing of the produce (23.66%).

Strengths of tomato cultivation as perceived by the tomato farmers :

Success of any farm business mainly depends upon net income. In addition to significant increase in yields, tomato was also giving higher net income to farming community. Less water requirement of the crop *i.e.*, 2-3 irrigations at critical stages is sufficient. Unlike other crops it attracts less pests and diseases thereby reduces the labour requirement for plant protection and as well as intercultural operations, and harvesting. All these factors lead to low cost of cultivation of the crop. Further, staking which is particular to the crop which provides support to the growing plant and also helps in improving the quality of fruits.

In tomato, high demand is prevailing for the processed products especially in national and international markets. Hence, the concerned agencies should make efforts to create and establish infrastructure both to process and export the tomato produce to realize the maximum benefit to the farmers.

Because of availability of HYV, higher yields can be obtained with lesser amount of inputs. Costs incurred on plant protection is minimized as the varieties available are disease resistant.

Table 2 : Weaknesses of tomato cultivation as perceived by the farmers

Sr. No.	Weaknesses	Ranks										RBQ	Rank
		I	II	III	IV	V	VI	VII	VIII	IX	X		
1.	Price instability	63	24	19	14							91.34	I
2.	Whole salers and retailers role in price fixation	51	32	23	14							90	II
3.	Higher hiring charges of the transport vehicles	32	37	24	27							86.17	III
4.	Non-availability of labour		24	41	36	19						75.84	IV
5.	High cost of plant protection chemicals		22	43	34	21						75.50	V
6.	Less bargaining power of farmers			31	48	25	16					67.84	VI
7.	Lack of planning about tomato production			31	39	33	17					67	VII
8.	Lack of direct farmer access to retailers and super markets			31	37	29	23					66.34	VIII
9.	Lack of market information resources				42	35	28	15				58.67	IX
10.	Micro nutrient deficiencies						26	39	31	24		35.58	X

Tomato is in higher demands compared to other vegetables and thus the market for tomato is generally good. So, it has better price in the market. Due to easy accessibility of tomato growers to the market there is no greater risk of loss during transportation of the highly perishable tomatoes. Tomato has more demand during the off season because, farmers who produce tomatoes during the off –season have better bargaining power as tomato is scarce in the market at that time. In this situation, farmers have the upper hand in controlling the market price.

Weaknesses of tomato cultivation as perceived by the tomato farmers :

Small farmers who produce the bulk of tomato suffer from price fluctuation. They are forced to sell their produce to local merchants who have all the access to buy the tomatoes at whatever price they fix. Wholesalers and retailers are playing major role in price fixation. Hence, there is every need to strengthen the mechanism for fixing minimum support price for tomato produce. Marketing agencies and traders should fix the tomato prices on a scientific basis. As tomato is a perishable product, the produce has to be stored in cold storage godowns if at all the farmers want to sell their produce for better prices after sometime when the prices are high. But in reality the farmers do not have the proper storage and also proper transport facilities to deliver their produce to the markets and to the storage godowns. These

situations forced the farmers to sell their produce in their vicinity in order to cut transport costs.

As the prices of the pesticides increasing day by day there is a constraint in the usage of pesticides for plant protection. Labour is also considered as the biggest scarce resource during the peak periods of crop growing season like weeding, harvesting etc.

In most of the cases, farmers are less educated and less knowledgeable than the middle man. Therefore, the middle men are likely to have power regarding marketing of the produce of the farmers. Moreover, considering the lack of storage facilities and highly perishable nature of the crop, farmers are easily exploited by the wholesalers and are forced to sale their produce at a lower prices.

Very few non-governmental agencies are paying attention to the production of value added products of the crop, though these kind of products are having high demand in the market.

There is no integrated and systemic approach in planning for tomato production by the farmers which in turn leads to surplus production and fluctuations in the prices.

There is lack of direct farmer access to retailers and supermarkets which give scope for the intervention of the middlemen who play a major role in the tomato marketing. The loss caused due to price decline is immediately transferred to growers while the profits on account of good prices are taken by middlemen.

Table 3 : Opportunities of tomato cultivation as perceived by the farmers

Sr. No.	Opportunities	Ranks										RBQ	Rank	
		I	II	III	IV	V	VI	VII	VIII	IX	X			
1.	Strengthening of public private partnership	36	31	29	24								86.58	I
2.	Provision of storage facilities	34	29	24	21	12							84.33	II
3.	Opportunities to set up processing industries	27	26	26	24	17							81.83	III
4.	Build the capacities of the farmers on post harvest techniques <i>i.e.</i> grading, sorting, packaging etc.	23	21	19	17	15	12	13					74.31	IV
5.	Developed organized tomato marketing systems in the main production centres	-	13	10	16	21	27	33					58.74	V
6.	Provision of government support for market integration and agro-enterprise development	-	-	12	18	21	22	22	25				51.74	VI
7.	Raise in export prices to achieve higher margins in current and future export markets by enhancing quality					19	21	21	24	35			37.08	VII
8.	Favourable climate					15	19	24	29	33			36.16	VIII
9.	Requires no skilled labour						19	7	22	25	47		23.81	IX
10.	Contact farming initiatives which needs to be encouraged through supportive policies								20	27	73		15.58	X

Opportunities of tomato cultivation as perceived by the tomato farmers:

An observation of results of the Table 1 shows the opportunities of tomato cultivation as perceived by the respondents. Facilities for strengthening of public and private partnership in agriculture was given first rank under opportunities. This could be due to the fact that cent percent of hybrids were released by the private seed companies and package of practices were recommended by state agricultural universities. In addition to that number of research projects on development of varieties and hybrids are being undertaken by the ICAR and SAU's with collaboration of private seed companies. If we consider reducing the budget burden on government, it will be in right direction. Similarly public-private partnership in research and extension facilitates sharing of knowledge thereby enhances overall efficiency of agricultural production system.

Many horticultural crops have a relatively short harvesting season. Storage is needed to extend the marketing period. So, the storage facilities should be provided to increase the life span of the product.

Tomato growers should be given intensive training related to post harvest handling of the produce. Such training should cover improved technologies including grading, packaging, pre-cooling storage and transportation. This will help in avoiding post harvest losses in tomato leading to an increase in their farm income.

There is an opportunity to setup processing industries because there is a high demand for the value added products of tomato crop especially in towns and cities due to its nutritional composition. Hence, enough infrastructure should be built to explore the market of

tomato processed products in the society.

As rainfall, temperature and other climatic factors are favourable for crop growth in the study area, good yield of the crop is possible. Besides various agronomic operations involved in tomato production do not require much skilled labour.

Small farmers who produce the bulk of tomato, suffer for price fluctuation. This lead to forced selling of the produce to local merchants who have all the access to buy tomatoes at whatever price they fix. Hence, organized tomato market systems in the main production centers region are needed in order to assist and encourage those involved in the development of the tomato industry.

The government support for market integration and agro-enterprise development provides an opportunity for the tomato growers and market actors. This indicates that the government is using policy support as one of the mechanisms for creating investment opportunities in the vegetable promotion sector for production, transportation, grading, exporting and financing the venture.

Challenges of tomato cultivation as perceived by the tomato farmers:

The prime responsibility of distributing tomato seed lies in government and it is the main source of procuring seed by the farmers. Hence, frequently the farmers are facing the constraints of not getting seed in time to start the sowing immediately after commencement of the season.

The information on various production practices, processing operations and marketing aspects of tomato crop is not centrally documented and disseminated to

Table 4 : Challenges of tomato cultivation as perceived by the farmers

Sr. No.	Challenges	Ranks										RBQ	Rank
		I	II	III	IV	V	VI	VII	VIII	IX	X		
1.	Non-availability of seed in time	36	34	29	21							87.08	I
2.	Weak management information system	34	31	28	27							85.99	II
3.	Labour migration to nearby cities/towns	29	27	24	22	18						82.24	III
4.	Farmers do not have their own transport to deliver the product to the market	21	19	21	24	35						77.25	IV
5.	High cost of chemical fertilizers		9	18	26	27	19	21				62.32	V
6.	Frequent price slashes due to changes in export policies or unregulated domestic markets					21	23	25	27	24		39.16	VI
7.	Lack of co-ordination between ministry of agriculture and other departments						20	21	19	29	31	27.49	VII
8.	Lack of extension and advisory services						19	14	26	29	32	26.56	VIII
9.	Cash payments not received in time						18	17	24	24		26.24	IX
10.	Malpractices of merchants in the mandies							29	25	27	39	23.66	X

the stakeholders of tomato crop production *i.e.* farmers, researchers, extensionists, NGOs and private companies. In this connection the information on all aspects of tomato crop has to be collected, synthesized, processed and disseminated to the end users in the form of modules that means what variety to be grown to match which kind of value added product and where to market. There should be one central information system and this has to be connected to various satellite information centres established at mandal levels.

Due to more employment and earning opportunities in the cities and towns, more labourers are migrated from villages to other urban areas which lead to the scarcity of labour in the villages. As the mechanization in tomato cultivation is also less in the present days, though there is a lot of scope. These conditions through a serious threat to the future tomato cultivation.

Farmers do not have their own transport to deliver their produce to the markets. Hence, they hire transport to deliver their produce. This situation forced the farmers to sell their produce in their community in order to reduce the transport cost. Therefore, extension officers need to address this issue by encouraging farmers to apply for credit so that they can buy their own transport.

Continuous increase in the cost of plant protection chemicals and fertilizers make the farmers unable to use the recommended doses which in turn lead to some of the nutrient deficiencies in the crop.

Malpractices by the merchants due to lack of awareness on the part of the tomato growers, lack of proper contacts of tomato growers with government agencies and institutions on getting the information regarding preservation and storage facilities resulted in the exploitation of the farmers.

As farmers are not getting cash immediately after selling their produce in the markets, they are unable to pay for their farm inputs, social obligations and urgent family needs.

Lack of extension and advisory services on tomato marketing on the part of the farmers lead to insufficient information from the extension officers. So there is a need for regular market information dissemination to farmers. Well trained and knowledgeable extension officers only can design programmes to provide farmers with market, credit and production information.

Conclusion :

SWOC analysis of tomato cultivation in chittoor district revealed that greater demand for value added products of tomato was the major strength, while establishment of processing industries and provision of storage facilities were perceived as major opportunities by the tomato farmers. For improving tomato cultivation the mentioned strengths should be consolidated upon and developmental activities should be directed towards the perceived opportunities. Non-availability of labour was perceived as the most important hurdle. Fluctuating market price was perceived to be most important challenge. Problems like fluctuating market price could be solved by setting up of market regulating body and also market information could be supplied to the farmers by setting up of market intelligence cells across the state so that the farmers can decide when and where to sell the produce. In addition, tomato price stabilization measures such as creation of processing units should be given priority at government level.

Authors' affiliations :

V. SAILAJA, P.V. SATHYA GOPAL AND D. SUBRAMANYAM,
Department of Agricultural Extension, S.V. Agricultural College
(A.N.G.R.A.U.), TIRUPATI (A.P.) INDIA

REFERENCES

- Kattel, K.** (2011). SWOT analysis on tea cultivation in Nepal. M.Sc. (Ag.) Thesis, Acharya N.G. Ranga Agricultural University, Hyderabad, A.P. (INDIA).
- Kondareddy, M. V.** (2000). SWOT analysis of cotton cultivation in Guntur District of Andhra Pradesh. M.Sc. (Ag.) Thesis. Acharya N. G. Ranga Agricultural University, Hyderabad, A.P. (INDIA).
- Kumar, S. et al.** (2006). SWOT analysis of potato cultivation in East Khasi hills district of Meghalaya: Farmers perception. *Potato J.*, **33**(3-4):144-148.
- Mahdei, K. N.** (2005). A "SWOT" analysis of medicinal plant production in Iran. *Acta Hort.*, **678**: 23-27.
- Rao, B.M.** (2016). SWOT analysis of Bt Cotton cultivation in Andhra Pradesh. *Andhra Agric. J.*, **63** (1): 219-225

12th
Year
★★★★★ of Excellence ★★★★★