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Production of turmeric in India: An analysis

V Mahesh
Department of Commerce, Annamalai University, Annamalai Nagar, Tamil Nadu, India

Abstract
India is the largest producer, consumer and exporter of turmeric in the world. Indian turmeric is considered to be the best in the world market because of its high cur cumin content. India accounts for about 80 per cent of world turmeric production and 60 percent of world exports. Other major producers are Pakistan, China, Haiti, Jamaica, Peru, Taiwan and Thailand. Hence, this paper makes an attempt to analyze the prospects of Turmeric production in India including the state wise production of turmeric in India.

Keywords: the overview of turmeric production, state wise turmeric production and prospects

Introduction
India is the world kingdom of spices and largest producer as well as consumer of turmeric in the world. It is known as the 'Golden Spice of life' and is one of the most essential spices used as an important element in culinary all over the world. It is an important commercial spice grown in India. India Turmeric is measured best in the world. Turmeric is grown only in 6% of the total area under spices in India and India is the major producer and exporter of turmeric in the world and accounts for 78% world's total production. Further, Turmeric in second largest foreign exchange earner among Indian spices. India consumes nearly 80% of turmeric, (Thiripurasundari). It is a common practice in Nigeria and other parts of the world to use the plant in the form of crude extracts, decoction, infusion or tincture to treat common infection and chronic conditions (Tamizhazhagan *et al*., 2017 Padmapriya *et al*., 2017) [10, 11].

The main turmeric producing states in India are Andhra Pradesh, Tamilnadu, Orissa, West Bengal, Maharashtra, Karnataka, and Kerala. Andhra Pradesh is the single largest producer of turmeric accounting for more than 60 per cent of total turmeric produced in the country. Tamilnadu is the second largest producer contributing for about 17 per cent of output in the country followed by Odisha, West Bengal and Karnataka.

Need and Importance of the Study
The principal use of turmeric worldwide is a major factor in curry powder, but it is also used in other spice mixes. It was beloved by the ancient not only for its fragrance and flour but also for its brilliant yellow color. It is mentioned in the 'Vedas' that turmeric had been used at the time on marriages, worship and other religious ceremonies of the Hindus even known its considered a sign of good omen at given importance at the time of festival etc. Turmeric has been used as a factor in Ayurvedic and Unani system of medicine in India for ancient times. It is claimed to be a stomach tonic, blood purifier, anthithistance, antacid, antipyretic and carminative. Turmeric is a flavor agent and for importing incorporation. It is added not only for coloring but also for increasing the flour and hotness of the food. It is used in pickles as a preservative and also as coloring matter for butter, cheese and other foodstuffs. In most of the Asian countries, turmeric is used as a food additive in almost all vegetables, meat and fish preparations. In the textile industry, turmeric was used as a dye for silk, cotton and wool, though it is no longer used as a dye due to lack of fastness. In the foundation in pharmaceutical industry, it is expansively used in preparations of original medicines, turmeric is also an important spice used in culinary preparation.

Statement of the Problems
On the basis of the review of the literature the researcher identifies the following problems.The spices of turmeric growers suffering from problems on various aspects like monsoon failure lacks technology, storage problem, problems with private vendors and mediators. Indian agricultural is heavily dependent on monsoon. The monsoon plays a critical role in determining whether the harvest will be rich, average or poor. The structural weakness of the agriculture sector is reflected in the low level of public investment, exhaustion of the yield likely of new high yielding varieties of turmeric, imbalanced fertilizers use, low seeds replacement rate, an inadequate incentive system and post-harvest value addition. Generally, the turmeric growers are cultivating varieties of turmeric depending on the soil conditions. Due to poor literacy, they are very weak in marketing their products. The majority of turmeric growers depend only on mediators to sell out their products and they yield low income.

The turmeric cultivation in Tamil Nadu does generate more employment opportunities especially among the people in rural areas. Turmeric grower has to rely mainly upon human labour for preparation of land, mulching, weeding, manuring, spraying of pesticides and harvesting. But, today unskilled and deficit workforce is a very big problem in cultivation of agro activities due to agricultural labour forces that are shifting towards the construction industry, textile industry, and other unorganized sectors.

Objectives of the Study

The following objectives are framed by the researcher on the basis of problems identified from the review of literature.

1. To present an overview of turmeric Production in India.
2. To analyze the state-wise turmeric production in India.

Research Methodology

The present study is based on the secondary data and ten years of 2007-08 to 2016-17 data were collected for the study. The researcher interprets and growth rate has been used for analyzing the collected data.

Production of turmeric in India

India has 193.40 thousand hectares under turmeric cultivation with a total production of 1052.10 thousand tonnes. Andhra Pradesh topped both in area and production with 16.60 thousand hectares and 134.10 thousand tonnes respectively. Tamil Nadu follows with 29.30 thousand hectares with 112.60 thousand tonnes (2016- 2017). Productivity was highest in Tamil Nadu 3.84 Mt/ha. Turmeric is a seasonal product which is available in the market mainly in two seasons, commencing in mid-February to May and second season is mid-August to October. The important varieties used in India are 'Alleppey Finger' (Kerala) Erode and Salem turmeric' (Tamil Nadu), 'Rajapore' and 'Sangli turmeric' (Maharashtra) and Nizamabad Bulb' (Andhra Pradesh) in Tamilnadu, the important varieties in cultivation are Erode local, BSR-1, PTS-10, Roma, Suguna, Sudarsana and Salem local. Among these varieties, 70-75 per cent is occupied by the local varieties. Some of the important turmeric varieties exported from India is Alleppey Finger Turmeric, Rajapuri, Madras and Erode variety. The processed forms of turmeric exported are dry turmeric, fresh turmeric, turmeric powder and oleoresin.

Major Turmeric Growing States in India

The area under turmeric cultivation and quantity of turmeric production of major turmeric growing states are shown in the following tables. The major turmeric cultivating states in India are Andhra Pradesh, Tamilnadu, Odisha, West Bengal, Maharashtra, Karnataka, and Kerala. The average results indicate that Andhra Pradesh produces the maximum quantity and also has the largest area of turmeric cultivation. Next to it are Tamil Nadu and Orissa as significant turmeric cultivation states in India.

Table 1: Turmeric production in Andhra Pradesh (Area: '000 ha, Production '000 Tonnes)

S. No.	Year	Area	Production	Growth
1	2007-08	63.0	416.0	-
2	2008-09	61.6	403.0	- 3.13
3	2009-10	59.5	364.0	- 9.68
4	2010-11	69.16	466.93	28.28
5	2011-12	81.17	506.87	8.55
6	2012-13	67.76	438.9	- 13.40
7	2013-14	17.82	151.91	- 6.54
8	2014-15	16.53	143.23	- 5.71
9	2015-16	17.02	121.12	- 15.44
10	2016-17	16.60	134.10	10.72

***Source*:** Compiled by The Researcher from Various Reports published by Agricultural Department of Tamil Nadu.

It is observed from the table-1that the area of cultivation of turmeric ranged from 16.53 hectares to 81.17 hectares during the sample study period. The cultivation area continuously decreased from the year 2007-08 to 2009-10 so the production also decreased at the same time it is interesting to note down from the table-1that the production of turmeric increased in the year 2010-11and 2011-12 due to increase the size of cultivation area of turmeric. Therefore, the production of turmeric ranged from 121.12 metric tonnes in the year 2015-16 to 506.87 metric tonnes in the year 2011-12. The succeeding years from the year 2013-14 the cultivation area for the turmeric is highly fluctuating as well as turmeric production. The growth rate of the turmeric production showed highly fluctuating trend and the majority year of the study period it shows negative growth so it ranges from -15.44 per cent to 28.28 per cent in the sample study period.

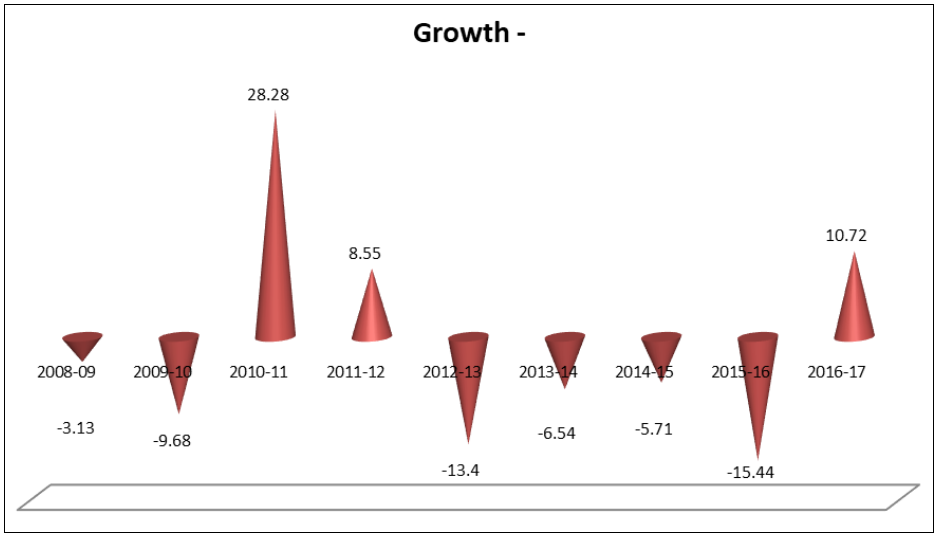

Fig 1: Turmeric production in Andhra Pradesh

Table 2: Turmeric production in Tamil Nadu (Area:'000 ha, Production '000Tonnes)

S.No.	Year	Area	Production	Growth
1	2007-08	27.3	146.0	-
2	2008-09	34.6	172.3	18.01
3	2009-10	33.4	169.3	- 1.74
4	2010-11	51.45	277.98	64.19
5	2011-12	67.25	368.41	32.53
6	2012-13	46.15	174.78	- 52.55
7	2013-14	77.0	462.0	164.33
8	2014-15	32.0	117.4	- 61.60
9	2015-16	34.73	132.40	12.77
10	2016-17	29.30	112.60	- 14.95

***Source*:** Compiled by The Researcher from Various Reports published by Agricultural Department of Tamil Nadu.

It is observed from the table-2 that the area of cultivation of turmeric ranged from 27.3 hectares to 67.25 hectares during the sample study period. The cultivation area continuously decreased from the year 2007-08 to 2010-11 so the production also decreased at the same time it is interesting to note down from the table-2 that the production of turmeric increased in the year 2010-11and 2011-12 due to increase the size of cultivation area of turmeric. Therefore, the production of turmeric ranged from 112.60 metric tonnes in the year 2016-17 to 462.0 metric tonnes in the year 2013-14. The succeeding years from the year 2014-15 the cultivation area for the turmeric is highly fluctuating as well as turmeric production. The growth rate of the turmeric production showed highly fluctuating trend and the majority year of the study period it shows negative growth so it ranges from -61.60 per cent to 164.33 per cent in the sample study period.

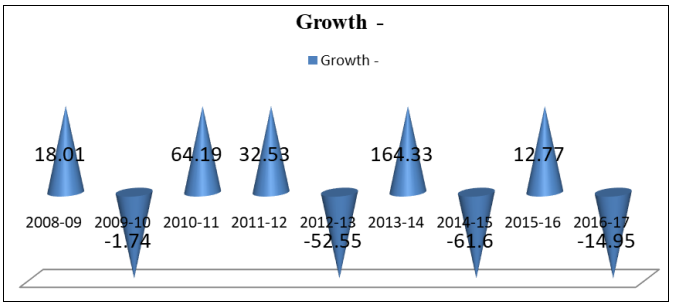

Fig 2: Turmeric production in Tamil Nadu

Table 3: Turmeric production in Odisha (Area:'000 ha, Production '000Tonnes)

SL.NO	Year	Area	Production	Growth
1	2007-08	24.7	59.4	-
2	2008-09	25.1	61.5	3.53
3	2009-10	25.3	189.4	207.96
4	2010-11	2.29	30.33	- 83.98
5	2011-12	2.36	35.69	17.67
6	2012-13	2.48	30.00	- 15.94
7	2013-14	2.5	30.00	0
8	2014-15	2.5	30.00	0
9	2015-16	2.48	30.00	0
10	2016-17	3.20	35.80	19.33

***Source*:** Compiled by The Researcher from Various Reports published by Agricultural Department of Tamil Nadu.

It is observed from the table-3that the area of cultivation of turmeric ranged from 2.5 hectares to 25.3 hectares during the sample study period. The cultivation area continuously decreased from the year 2013-14 to 2015-16 so the production also decreased at the same time it is interesting to note down from the table-3 that the production of turmeric increased in the year 2008-09 and 2009 -10 due to increased the size of cultivation area of turmeric. Therefore, the production of turmeric ranged from 30.00 metric tonnes in the year 2014-15 and 2015-16 to 189.4 metric tonnes in the year 2009-10. The succeeding years from the year 2013-14 the cultivation area for the turmeric is highly fluctuating as well as turmeric production. The growth rate of the turmeric production showed highly fluctuating trend and the majority year of the study period it shows negative growth so it ranges from -83. 98 per cent to 207.96 per cent in the sample study period.

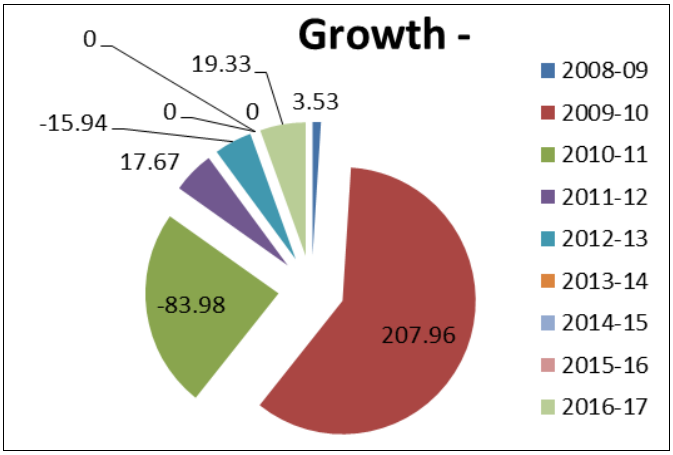

Fig 3: Turmeric production in Odisha

Table 4: Turmeric production in Karnataka (Area:'000 ha, Production '000Tonnes)

SL.NO	Year	Area	Production	Growth
1	2007-08	8.5	64.7	-
2	2008-09	15.3	93.8	44.97
3	2009-10	17.9	65.8	- 29.85
4	2010-11	14.16	70.16	6.63
5	2011-12	25.53	128.21	82.73
6	2012-13	19.69	92.41	- 27.92
7	2013-14	14.0	65.4	- 29.22
8	2014-15	13.36	63.62	- 2.72
9	2015-16	12.82	76.78	17.40
10	2016-17	15.00	76.50	- 0.36

***Source*:** Compiled by The Researcher from Various Reports published by Agricultural Department of Tamil Nadu.

It is observed from the table-4 that the area of cultivation of turmeric ranged from 8.5 hectares to 25.53 hectares during the sample study period. The cultivation area continuously decreased from the year 2012-13 to 2015-17 so the production also decreased at the same time it is interesting to note down from the table-4 that the production of turmeric increased in the year 2010-11and 2011-12 due to increased the size of cultivation area of turmeric. Therefore, the production of turmeric ranged from 64.7 metric tonnes in the year 2007-08 to 128.21 metric tonnes in the year 2011-12. The succeeding

years from the year 2012-13 the cultivation area for the turmeric is highly fluctuating as well as turmeric production. The growth rate of the turmeric production showed highly fluctuating trend and the majority year of the study period it shows negative growth so it ranges from -29.85 per cent to 82.73 per cent in the sample study period.

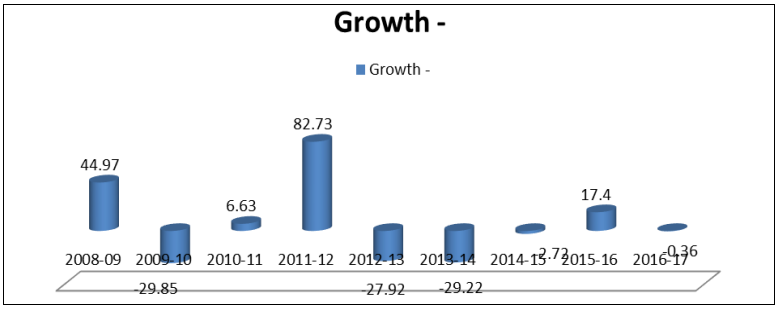

Fig 4: Turmeric production in Karnataka

Table 5: Turmeric production in west Bengal (Area:'000 ha, Production '000Tonnes)

SL.NO	Year	Area	Production	Growth
1	2007-08	14.9	34.6	-
2	2008-09	15.2	35.4	2.31
3	2009-10	15.5	36.4	2.82
4	2010-11	17.00	38.30	5.22
5	2011-12	15.80	42.00	9.66
6	2012-13	16.20	39.40	- 6.19
7	2013-14	15.80	42.0	6.59
8	2014-15	15.80	42.0	0
9	2015-16	16.71	42.41	0.98
10	2016-17	18.00	45.50	7.29

***Source*:** Compiled by The Researcher from Various Reports published by Agricultural Department of Tamil Nadu.

Table 6: Turmeric production in Maharashtra (Area:'000 ha, Production '000Tonnes)

Sl. No	Year	Area	Production	Growth
1	2007-08	7.0	8.0	-
2	2008-09	6.8	8.5	6.25
3	2009-10	6.8	8.6	1.18
4	2010-11	14.04	13.34	55.12
5	2011-12	11.0	11.0	- 17.54
6	2012-13	13.48	32.05	191.36
7	2013-14	13.48	32.05	0
8	2014-15	13.48	32.05	0
9	2015-16	9.61	136.87	327.05
10	2016-17	\10.70	177.90	30.00

***Source*:** Compiled by The Researcher from Various Reports published by Agricultural Department of Tamil Nadu.

It is observed from the table-1that the area of cultivation of turmeric ranged from 14.9 hectares to 18.00 hectares during the sample study period. The cultivation area continuously decreased from the year 2011-12 to 2015-16 so the production also decreased at the same time it is interesting to note down from the table-1that the production of turmeric increased in the year 2010-11and 2016-17 due to increased the size of cultivation area of turmeric. Therefore, the production of turmeric ranged from 34.6 metric tonnes in the year 2007-08 to 45.50 metric tonnes in the year 2016 -17. The succeeding years from the year 2013-14 the cultivation area for the turmeric is highly fluctuating as well as turmeric production. The growth rate of the turmeric production showed highly fluctuating trend and the majority year of the study period it shows negative growth so it ranges from -6.19 per cent to 7.29 per cent in the sample study period.

It is observed from the table-1that the area of cultivation of turmeric ranged from 6.8 hectares to 14.04 hectares during the sample study period. The cultivation area continuously decreased from the year 2007-08 to 2009-10 so the production also decreased at the same time it is interesting to note down from the table-1that the production of turmeric increased in the year 2010-11and 2016 -17 due to increased the size of cultivation area of turmeric. Therefore, the production of turmeric ranged from 8.0 metric tonnes in the year 2007-08 to 506.87 metric tonnes in the year 2016-17. The succeeding years from the year 2011-12 the cultivation area for the turmeric is highly fluctuating as well as turmeric production. The growth rate of the turmeric production showed highly fluctuating trend and the majority year of the study period it shows negative growth so it ranges from -17.54 per cent to 327.05 per cent in the sample study period.

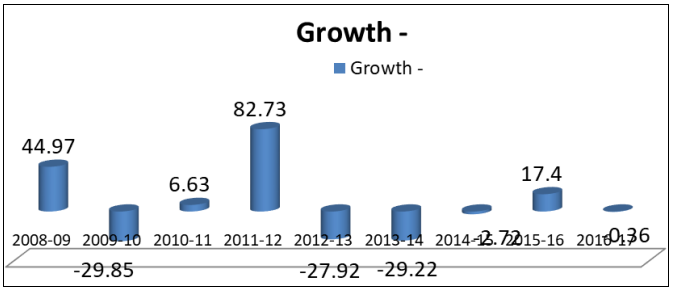

Fig 5: Turmeric production in west Bengal

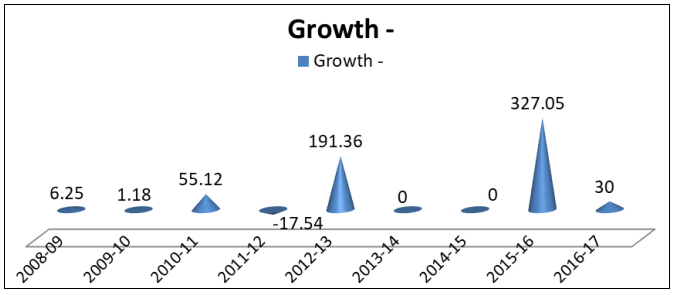

Fig 6: Turmeric production in Maharashtra

Table 7: Turmeric production in Kerala (Area:'000 ha, Production '000Tonnes)

SL.NO	Year	Area	Production	Growth
1	2007-08	3.2	7.4	-
2	2008-09	2.8	6.4	- 13.51
3	2009-10	2.4	6.1	- 4.69
4	2010-11	2.39	6.20	1.64
5	2011-12	2.97	7.95	28.23
6	2012-13	2.63	6.90	- 13.21
7	2013-14	2.43	6.25	- 9.42
8	2014-15	2.47	6.82	9.12
9	2015-16	2.53	6.50	- 4.69
10	2016-17	2.60	7.10	9.23

***Source*:** Compiled by The Researcher from Various Reports published by Agricultural Department of Tamil Nadu.

It is observed from the table-1that the area of cultivation of turmeric ranged from 2.4 hectares to 3.2 hectares during the sample study period. The cultivation area continuously decreased from the year 2007-08 to 2016-17 so the production also decreased at the same time it is interesting to note down from the table-1that the production of turmeric increased in the year 2011-12 and 2016-17 due to increase the size of cultivation area of turmeric. Therefore, the production of turmeric ranged from 6.1 metric tonnes in the year 2009-10 to 7.95 metric tonnes in the year 2011-12. The succeeding years from the year 2012-13 the cultivation area for the turmeric is highly fluctuating as well as turmeric production. The growth rate of the turmeric production showed highly fluctuating trend and the majority year of the study period it shows negative growth so it ranges from -13.51 per cent to 28.23 per cent in the sample study period.

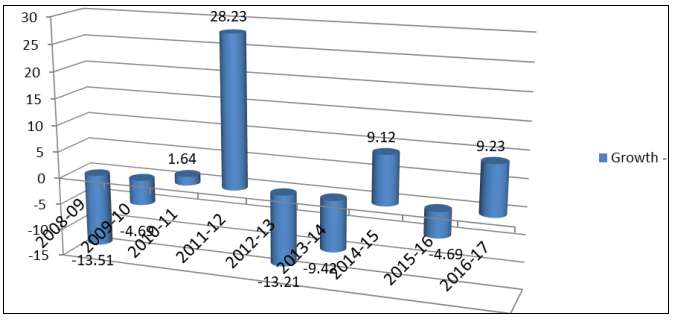

Fig 7: Turmeric production in Kerala

Prospects of Turmeric Production in India

Turmeric is an important commercial crop grown in India. The analysis of secondary data related to area, quantity and value of turmeric production in India shows as encouraging growth, as the climatic conditions, fertility of the soil, rainfall and cultivation practices are highly favorable in the majority of states of India. The expansion of area under turmeric cultivation will enrich the existing quantity of turmeric production in the country. Though price fluctuation may exist due to instability in the market, these can be eliminated by effective export promotional measures taken by the government. Promoting turmeric cultivation in the country will enhance the inflow of foreign exchange and improve the economic condition of the Indian farmer.

Suggestion

- The Spices Board has initiated several steps to encourage farming and processing of Turmeric.
- The Spices Spark will be established by the government in various turmeric producing states.
- While the cost of cultivation has been increasing steadily every year, there has not been a corresponding increase in the selling price. Hence the government should encourage farmers by fixing a remunerative price.
- The Spices Board Provide Strong Research support for cultivation of turmeric in various states.
- State wise demand of turmeric must be informed by the government to the farmers prior to cultivation
- The government can establish a separate Demand Estimation committee at state level. This well help to match the demand and supply of turmeric and thereby price fluctuation could be reduced to some extent.

Conclusion

Currently, the cultivation of turmeric has not been studied scientifically. A single state survey may provide much more information. Precision farming involves the use of most advanced technologies like GPS (Global Positioning System), GIS (Geographic Information Systems), remote sensing and VRT (Variable rate technologies). Such systems are designed to monitor, analyse and control plant production parameters with the aim to optimize expenses, reduce the ecological ill effects and increase yields. To fulfill such contrasting aims, the first prerequisite is to select the best suitable crop for an area or the best way to enhance soil quality specifically for turmeric cultivation. A land suitability analysis will best meet such a basic need.

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