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Growth in Area, Production and Productivity of Vegetables and Fruits in India with Special Reference to Karnataka

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Abstract

The analysis of growth is usually used in economic studies to find out the trend of a particular variable over a period of time and used for policy decisions. The necessary secondary data were collected for a period of 22 years from 1991-92 to 2012-13. It was divided into two sub periods, i.e., 1991-92 to 2000-01 and 2001-02 to 2010-11. The results of compound growth rate analysis are presented in the table for the periods 1991-92 to 2000-01, 2001-02 to 2010-11 and the whole period separately. The analysis is carried out for fruits and vegetables at all-India and Karnataka levels separately. For the study period 1991-92 to 2012-13 the growth rates of area and production of fruits showed positive of 4.3 percent. The productivity of fruit crop registered insignificant positive growth. The area, production and productivity of vegetables registered positive growth during the study period 1991-92 to 2012-13. Similarly, the area and production of fruits in Karnataka were shown positive rates of 1.80 and 0.90 percent respectively. But productivity recorded negative rate of -0.90 percent during the study period 1991-92 to 2012-13. The growth rates of area, production and productivity of vegetables exhibited positive rates of 1.90, 2.50 and 0.70 percent respectively.

Keywords: Growth in area, production and productivity, vegetables and fruits, Karnataka

1. Introduction

1.1. Battle Rope

Fruits and vegetables are a must in human diet to supplement the micronutrients required for proper nourishment along with carbohydrates and proteins. Kitchen gardening was quite common in both urban and rural areas in the past and is currently being carried out to a certain extent in small towns and villages. Vegetable and fruit market were prominent but have now gained more prominence. The nature and extent of marketing channels have changed with overtime especially after the new economic policy regime. For instance contract farming especially from large companies such as ITC, Pepsi, etc. has played a major role in crop shift, productivity and market channels of fruits and vegetables in the country.

2. All-India Level

2.1. Fruits

It is clear from table 1 that growth in area, production and productivity of fruits was positive for the period 1991-92 to 2000-01. The raise in the area at the rate of 3.10 percent and production was at the rate of 4.30 percent. The productivity exhibited a raising trend of 1.20 percent which is positive but not so significant.

The analysis of compound growth rate for the period 2001-02 to 2010-11 indicated that area and production under fruits registered significant positive growth rates at 5.80 percent and 6.70 percent respectively. The growth of productivity was 0.80 percent which is positive but not significant.

Table 1: Compound Growth Rate of Fruits in India - 1991-92 to 2012-13

Factors	Period 1991-92 to 2000-01		Period 2001-02 to 2010-11		Total period 1991-92 to 2012-13	
	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value
Area	3.10***	12.362	5.80***	12.142	4.3***	17.784
Production	4.30***	6.329	6.70***	22.925	4.3***	14.239
Productivity	1.20	1.618	0.80	1.282	0.00005	-0.034

Note: ***, **, * indicate significance level at 1, 5, and 10 percent, respectively

Table 2: Area, Production and Productivity of Fruits in India (1991-92 to 2012-13)

Year	Area (000' hectare)	Production (in 000' tone)	Productivity (Mt/hectare)
1991-92	2874	28632	10.00
1992-93	3206	32955	10.30
1993-94	3184	37255	11.70
1994-95	3246	38603	11.90
1995-96	3357	41507	12.40
1996-97	3580	40458	11.30
1997-98	3702	43263	11.70
1998-99	3727	44042	11.80
1999-00	3797	45496	12.00
2000-01	3869	43138	11.10
2001-02	4010	43001	10.70
2002-03	3788	45203	11.90
2003-04	4661	45942	9.90
2004-05	5049	50867	10.10
2005-06	5324	55356	10.40
2006-07	5554	59563	10.70
2007-08	5857	65587	11.20
2008-09	6101	68466	11.20
2009-10	6329	71516	11.30
2010-11	6383	74878	11.70
2011-12	6705	76424	11.30
2012-13	6982	81285	11.71
CGR (%)	4.3	4.3	0.00005

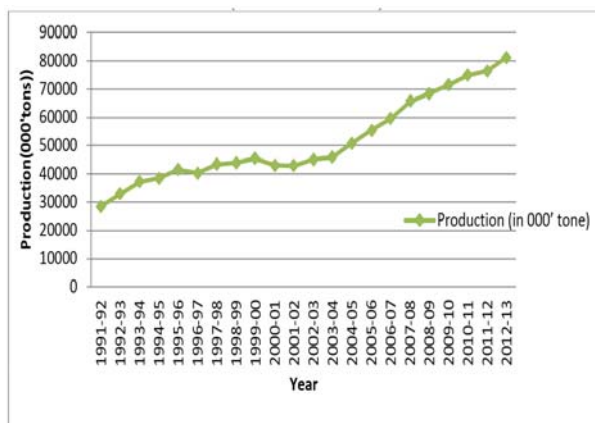


Fig 2: Trends in Production of Fruits in India(1991-92 to 2012-13)

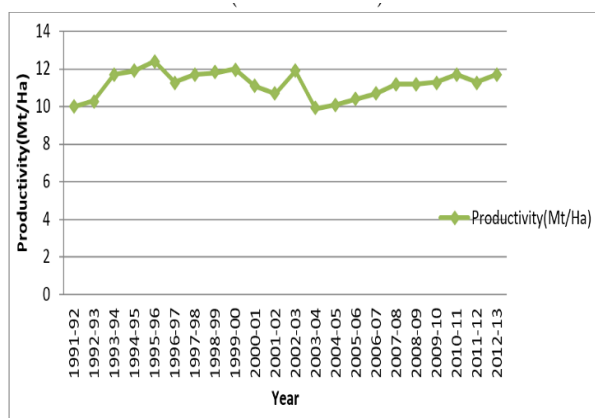


Fig 3: Trends in Productivity of Fruits in India (1991-92 to 2012-13)

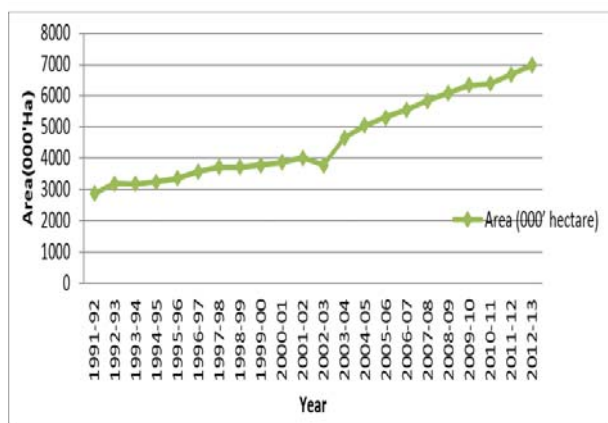


Fig 1: Trends in Area of Fruits in India (1991-92 to 2012-13)

For the whole study period, the area under fruits has increased from 2874 thousand acres to 6982 thousand acres at all India level during the period 1991-92 to 2013-13. The production of fruits has increased from 28632 thousand tons to 81285 thousand tons during the same period. Thus the area and production of fruits is shown to have a compound annual growth of 4.3 per cent per annum. The productivity of fruits represents an increasing trend 10 Mt / hectare in 1991-92 to 11.71 Mt /hectare in 2012-13. The raise in productivity of fruits was positive (0.0005) but not significant.

2.2. Vegetables

The results of growth rate of area, production and productivity of vegetables in India for the period 1991-92 to 2000-01, 2001-02 to 2010-11 and for the whole period 1991-92 to 2012-13 were represented in the table 3.

It is clear from the results that area, production and productivity of vegetables registered a positive growth rate in India for the period 1991-92 to 2000-01. The increase in the area production, and productivity were at the rate of 2.10

percent, 5.10 percent and 3.00 percent respectively. The analysis of compound growth rate for the period 2001-02 to 2010-11 revealed that the growth rate of area planted

was 4.01 percent and the growth of production at 6.30 percent. The productivity growth was positive 2.30 percent.

Table 3: Compound Growth Rate for Different Factors of Vegetables in India during 1991-92 to 2012-13

Factors	Period 1991-92 to 2000-01		Period 2001-02 to 2010-11		Total period 1991-92 to 2012-13	
	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value
Area	2.10*	3.696	4.01***	11.541	2.90***	14.585
Production	5.10***	10.077	6.30***	13.880	4.60***	15.928
Productivity	3.00***	4.747	2.30***	9.913	1.70***	10.896

Note: ***, **, * indicate significance level at 1, 5, and 10 percent, respectively

Table 4: Area, Production and Productivity of Vegetables in India (1991-92 to 2012-13)

Year	Area (000' hectare)	Production (in 000' tone)	Productivity (Mt/hectare)
1991-92	5593	58532	10.50
1992-93	5045	63806	12.60
1993-94	4876	65787	13.50
1994-95	5013	67286	13.40
1995-96	5335	71594	13.40
1996-97	5515	75074	13.60
1997-98	5607	72683	13.00
1998-99	5866	87536	14.90
1999-00	5993	90831	15.20
2000-01	6250	93850	15.00
2001-02	6156	88622	14.40
2002-03	6092	84815	13.90
2003-04	6082	88334	14.50
2004-05	6744	101246	15.00
2005-06	7213	111399	15.40
2006-07	7581	114993	15.20
2007-08	7848	128449	16.40
2008-09	7981	129077	16.20
2009-10	7985	133738	16.70
2010-11	8495	146555	17.30
2011-12	8989	156325	17.40
2012-13	9205	162187	17.60
CGR (%)	2.90	4.60	1.70

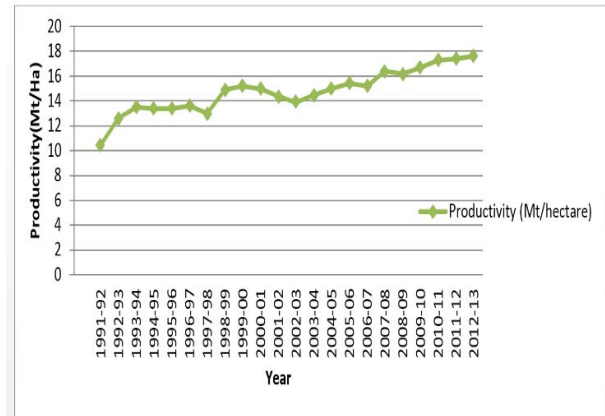


Fig 5: Trends in Production of Vegetables in India(1991-92 to 2012-13)

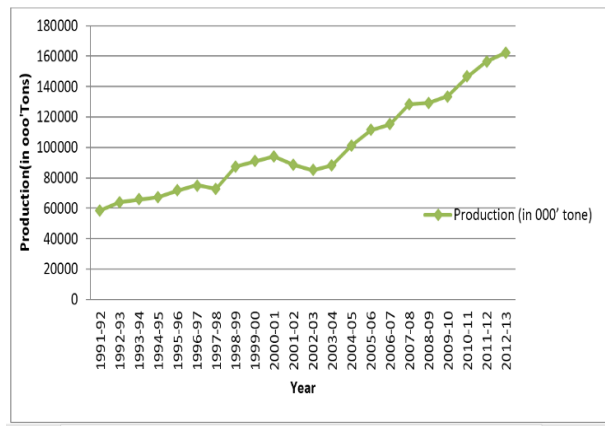


Fig 6: Trends in Productivity of Vegetables in India(1991-92 to 2012-13)

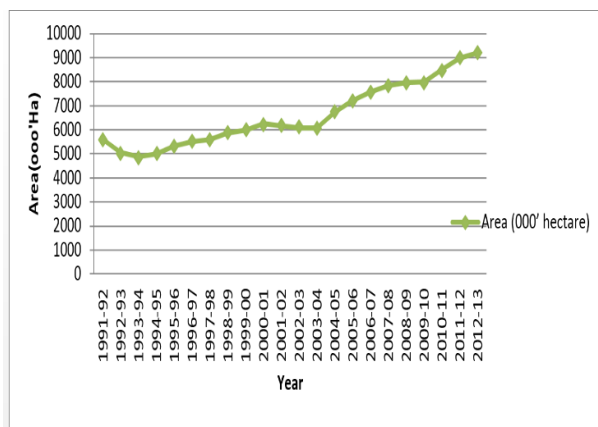


Fig 4: Trends in Area of Vegetables in India (1991-92 to 2012-13)

The area under vegetables at all India level has shown to increase from 5593 thousand hectare in 1991-92 to 9205 thousand hectare in 2012-13 at an annual growth rate of 2.9 per cent. Similarly production of vegetables increased almost three times from 58532 thousand tons to 162187 thousand tons during the same period showing a growth of 4.6 per cent per annum. Thus productivity has also shown to increase by about 70 per cent from 10.5 mt/ha to 17.6 mt/ha during the same period at 1.7 per cent per annum.

2.3. Karnataka State Level Fruits

It is observed from the table 5, that growth rate in area and production of fruits in Karnataka for the period 1991-92 to 2000-01 registered positive at 5.10 percent and 4.20 percent

respectively. But the growth rate of productivity exhibited negative at -0.90 percent.

The results for the second period 2001-02 to 2010-11 showed that area under fruits in Karnataka grew by 4.80 percent and the growth rate of production at 5 percent. Whereas productivity registered positive growth rate of 0.30 percent. The results for the whole study period exhibited that area and production of fruits in Karnataka was positive. During 1991-92 the area under fruits in Karnataka was 209.30 thousand

hectares. It rises to 388.20 thousand hectares in 2012-13 at a growth rate of 1.80 percent per year. The production of fruits has increased from 3673.20 thousand tons to 6619.60 thousand tons for the same period. Production grew at rate of 0.90 percent per annum. But the productivity growth rate was negative (-0.90) for fruits in Karnataka for the same period. It has registered a decline of 17.5 Mt / hectare to 17.10 Mt /hectare.

Table 5: Compound Growth Rate for Different Factors of Fruits in Karnataka during 1991-92 to 2012-13

Factors	Period 1991-92 to 2000-01		Period 2001-02 to 2010-11		Total period 1991-92 to 2012-13	
	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value
Area	5.10***	9.053	4.80***	5.917	1.80***	3.983
Production	4.20	3.311	5.00***	8.560	0.90	1.592
Productivity	-0.90	-600	0.30	.280	-0.90	-2.695

Note: ***, **, * indicate significance level at 1, 5, and 10 percent, respectively

Table 6: Area, Production and Productivity of Fruits in Karnataka(1991-92 to 2012-13)

Year	Area (000' hectare)	Production (in 000' tone)	Productivity (Mt/hectare)
1991-92	209.30	3673.20	17.50
1992-93	225.39	4662.20	20.60
1993-94	242.20	5035.20	20.80
1994-95	259.35	5668.40	21.80
1995-96	275.81	5705.10	20.70
1996-97	314.64	4978.70	15.80
1997-98	314.60	4944.90	15.70
1998-99	314.60	5870.00	18.60
1999-00	315.00	6796.90	21.60
2000-01	326.90	5763.00	17.60
2001-02	257.10	4173.20	16.20
2002-03	254.90	3707.90	14.50
2003-04	224.90	4176.10	18.60
2004-05	255.10	4382.90	17.10
2005-06	263.00	4488.50	17.06
2006-07	278.40	4736.00	17.01
2007-08	299.90	5000.60	16.70
2008-09	315.40	5269.80	16.70
2009-10	351.00	5712.40	16.30
2010-11	377.80	6273.60	16.60
2011-12	371.80	6428.10	17.30
2012-13	388.20	6619.60	17.10
CGR(%)	1.80	0.90	-0.90

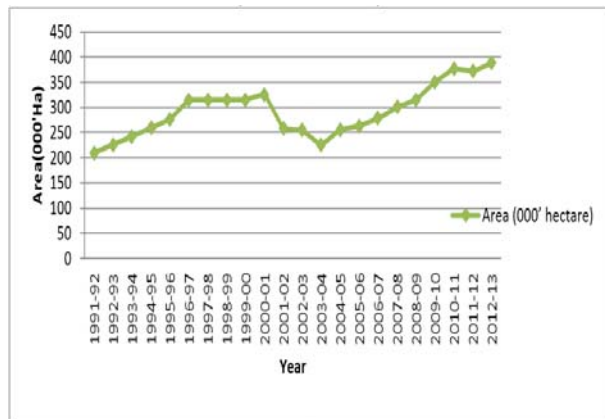


Fig 7: Trends in Area of Fruits in Karnataka (1991-92 to 2012-13)

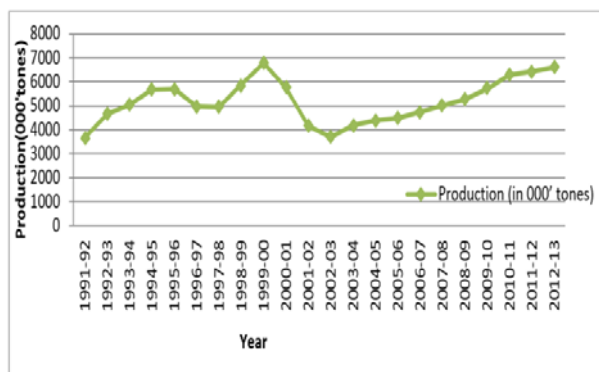


Fig 8: Trends in Production of Fruits in Karnataka(1991-92 to 2012-13)

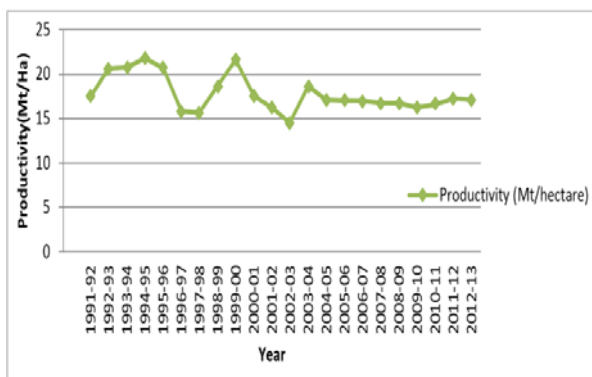


Fig 9: Trends in Productivity of Fruits in Karnataka(1991-92 to 2012-13)

2.4. Vegetables

It is clear from the table 7 that the area, production and productivity of vegetables in Karnataka for the period 1991-92 to 2000-01 exhibited a positive growth. The area grew at a rate of 1.90 percent per year, production growth was significant at a rate of 2.50 and the productivity grew at a rate of 0.70 per annum.

For the period 2001-02 to 2010-11 the area under plantation of vegetable crop in Karnataka registered a significant positive growth of 5.10 percent and production growth was 4.20 percent per year. The productivity has recorded a negative growth of -0.90 percent per year.

Table 7: Compound Growth Rate for Different Factors of Vegetables in Karnataka during 1991-92 to 2012-13

Factors	Period 1991-92 to 2000-01		Period 2001-02 to 2010-11		Total period 1991-92 to 2012-13	
	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value	Compound Growth Rate (%)	t-value
Area	1.90	0.55	5.10***	11.174	1.90***	5.640
Production	2.50	2.591	4.20***	7.077	2.50***	3.838
Productivity	0.70	1.178	-0.90***	4.942	0.70	0.779

Note: ***, **, * indicate significance level at 1, 5, and 10 percent, respectively

Table 8: Area, Production and Productivity of Vegetables in Karnataka (1991-92 to 2012-13)

Year	Area (000' hectare)	Production (in 000' tone)	Productivity (Mt/hectare)
1991-92	349.80	3673.20	10.50
1992-93	417.00	4662.20	11.20
1993-94	261.20	5035.20	19.30
1994-95	290.10	5668.40	19.50
1995-96	293.00	5705.10	19.50
1996-97	353.60	4978.70	14.10
1997-98	352.40	4944.90	14.00
1998-99	309.70	4955.20	16.00
1999-00	361.60	6796.90	18.80
2000-01	343.70	5763.00	16.80
2001-02	358.10	4173.20	11.70
2002-03	354.00	3707.90	10.50
2003-04	363.30	4176.10	11.50
2004-05	367.20	4382.90	11.90
2005-06	382.20	4488.50	17.20
2006-07	412.00	5478.30	13.30
2007-08	427.40	7367.10	17.20
2008-09	448.00	7724.90	17.30
2009-10	441.20	7082.20	16.10
2010-11	466.30	9056.40	19.40
2011-12	454.70	7662.50	16.85
2012-13	436.60	7841.90	16.85
CGR (%)	1.90	2.50	0.70

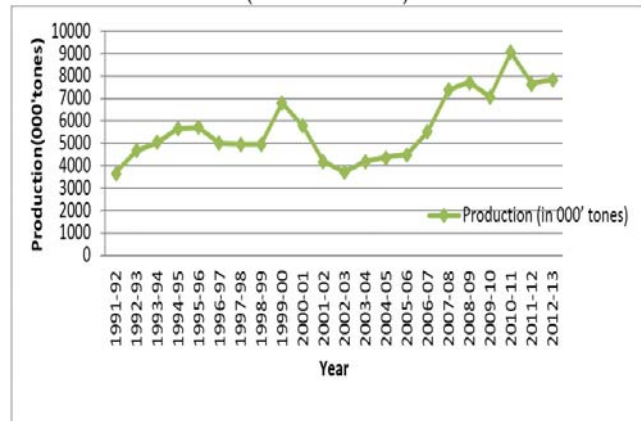


Fig 11: Trends in Production of Vegetables in Karnataka(1991-92 to 2012-13)

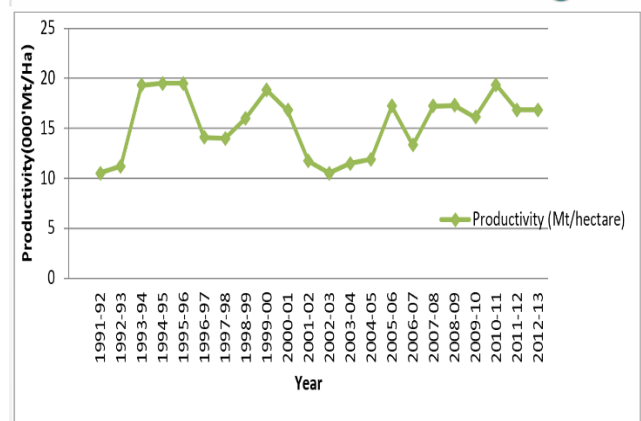


Fig 12: Trends in Productivity of Vegetables in Karnataka(1991-92 to 2012-13)

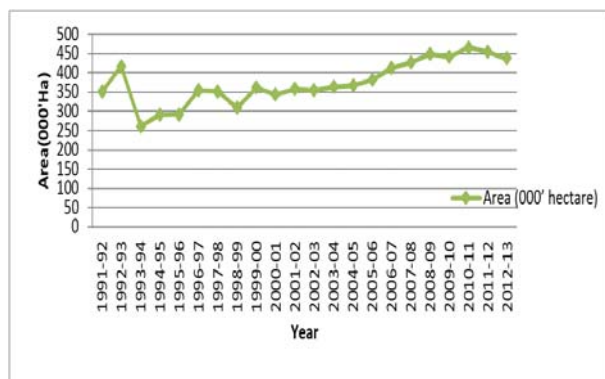


Fig 10: Trends in Area of Vegetables in Karnataka (1991-92 to 2012-13)

It is observed from the table 5.8 that area under vegetables in Karnataka has increased from 349.80 thousand hectares to 436.60 thousand hectares in 2012-13. The growth rate is positive 1.90 percent per annum. Similarly production of vegetables has doubled from 3673.20 thousand tons in 1991-92 to 7841.90 thousand tons in 2012-13 showing a growth of 2.50 percent per year. The productivity of vegetables per hectare increased from 10.50 Mt/hectare to 16.85 Mt/hectare for the same period registered growth of 0.70 percent per annum.

3. Conclusion

The area, production under fruits increased significantly at national level during 1991-92 to 2012-13, but the increase in yield of fruits was not so significant. In Karnataka during the same period the growth rates of area and production of fruits were shown positive rates but productivity recorded negative

rate. The growth rate area and production of vegetables was positive both at national and state level. The yield of vegetables at national and state level has increased but not significantly. Policies need to be focused to increase the yields of vegetables and fruits at national and state level. Scientific methods of cultivation of vegetables and fruits need to be carried out to increase the productivity. Research institutes need to be established in the major vegetables and fruit producing regions.

4. References

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