

BIBLIOGRAPHY

ATTIWAN, OREA M. APRIL 2012. Price Trend Analysis of Carrots in the Cordillera Administrative Region. Benguet State University, La Trinidad, Benguet.

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ABSTRACT

This study was conducted to know the movement of carrot prices and the factors that affect the changes of price at the same case to provide a guide to the producers and consumers of carrots. Data were gathered from the BAS Office – Benguet. The data were analyzed using regression and correlation analysis.

Prices were low during the first five months for the past ten years (2001-2010). Starting from June up to December, carrot prices were high. The rise and fall of prices was because of the weather condition, expectation of farmers and cropping pattern of the farmers.

Production area and volume of supply of carrots has no significant effect to the changes in farmgate price but it has a significant effect to the changes in wholesale and retail price.

The model that fitted to the observed data was the exponential trend model among because it has the lowest mean absolute percentage error (MAPE). It was observed that



there was a slightly increase in the computed monthly forecast of prices and it displays an upward trend.

It is therefore recommended for the farmers to become profitable entrepreneurs and not just as farmers, they should form a cooperative or a group that would help them to market their products whether the price is high or low, as cited by APO, cooperative marketing of products enables farmers to have strong bargaining power than to market their products individually; the Department of Agriculture should supervise or implement the production of carrots by province per cropping season. Provided that the other farmers belong to the provinces that do not produce carrots during the cropping season will still have an income through the subsidiary provided by the said agency; Department of Agriculture or other concerned agencies should provide a data of forecasted prices of agricultural commodities as a guide/basis for production activities of the producers and marketing activities of the consumers. And there should be further studies to be done to know the other factors that affect the price changes not only for carrots but for the other agricultural commodities.



RESULTS AND DISCUSSION

Price Trends of Carrots Farmgate Prices

Table 1 presents the actual monthly average farmgate prices of carrots for periods 2001-2010. It was noticed that the lowest farmgate price recorded was on February of year 2010 at Php 2.06 per kilogram. The highest farmgate price was recorded on October of year 2009 at Php 43.28 per kilogram. Based from the annual average farmgate price (Table 1), carrots were cheap in 2002 and expensive in 2009.

Figure 1 is the graphical presentation of the actual farmgate prices of carrots where the price trend in all years follows the same pattern from January to December except for the month of December of year 2001, 2005, 2006, and 2009 where there was a downward movement of price from November.



Table 1. Monthly average farmgate prices of carrots, 2001-2010 (Actual Data)

MONTHS	YEARS										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Ave.
January	-	10.19	8.25	5.33	16.41	15.32	9.27	21.04	12.67	3.93	11.38
February	10.21	9.02	12.88	4.39	15.68	15.48	8.5	14.8	12.38	2.06	10.54
March	6.79	8.74	11.88	4.52	19.8	8.23	10.41	13.42	15.49	4.82	10.41
April	4.07	7.79	18.32	3.95	14.09	7.74	11.33	13.59	17.67	4.64	10.32
May	8.16	10.75	24.24	4.78	11.09	8.75	14.7	16.65	33.87	6.02	13.90
June	9.09	10.49	30.31	13.57	11.95	9.12	16.36	18.83	35.43	13.07	16.82
July	5.95	20.41	12.18	16.87	16.44	11.65	14.4	25.62	19.1	25.19	16.78
August	7.86	15.74	20.75	30.65	7.73	20.54	15.62	27.95	26.79	22.57	19.62
September	16.87	9.56	22.58	34.85	7.8	31.19	15.93	31.05	33.4	18.73	22.19
October	26.47	6.92	19.4	36.52	28	38.25	19.66	30.16	43.28	12.73	26.14
November	14.86	6.34	13.85	12.57	22.64	29.89	20.31	15.52	38.85	12.62	18.75
December	11.46	10.45	16.18	15.03	21.73	14.6	26.25	16.9	16.93	17.41	16.69
Average	11.07	10.53	17.57	15.25	16.11	17.56	15.23	20.46	25.49	11.98	16.13



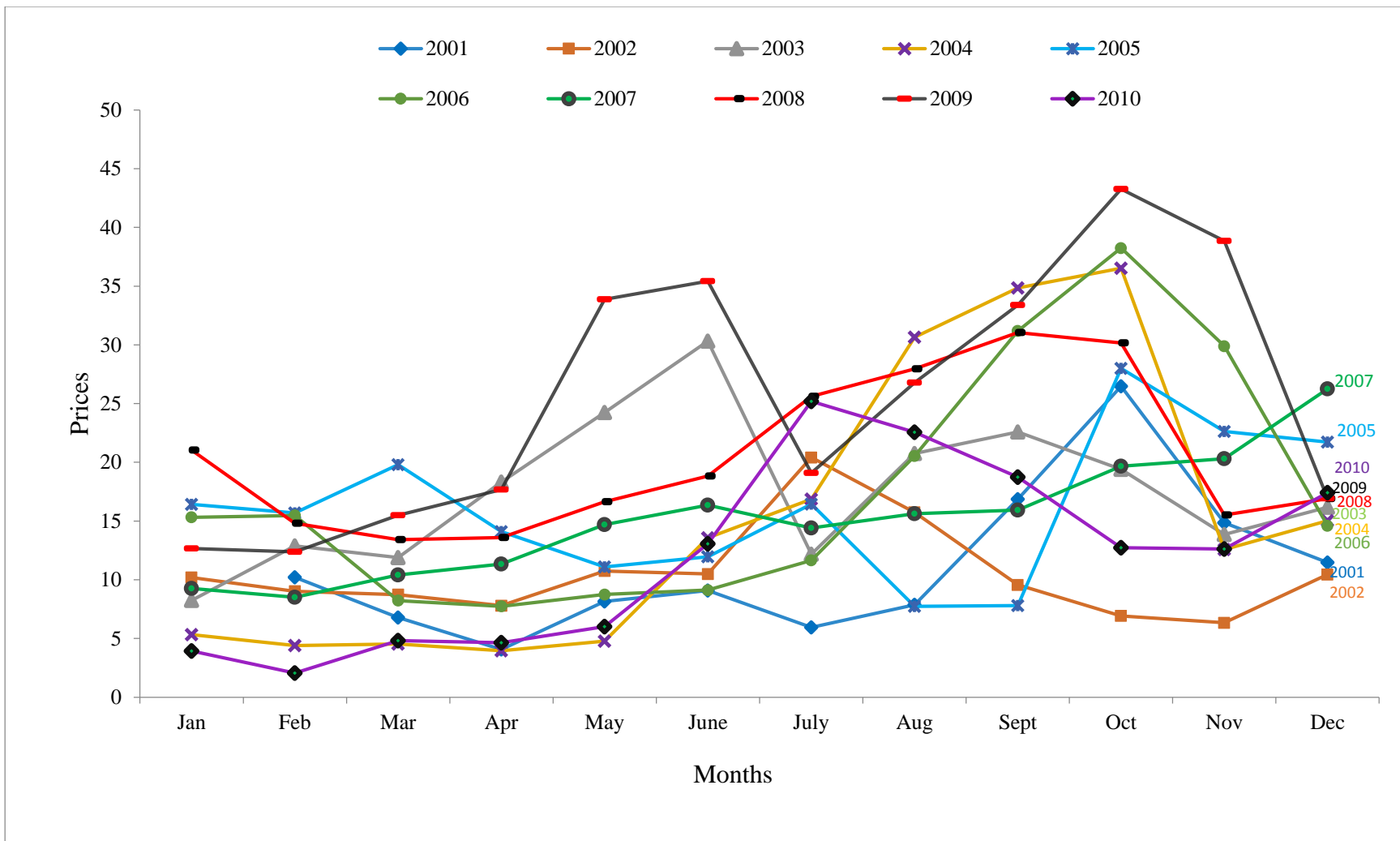


Figure 1. Monthly average farmgate prices of carrots, 2001-2010



Table 2 presents the average farmgate price and computed percentages of price changes of carrot for the past ten years. It was observed that highest price increase was on the month of May with 34.71% increase and the lowest price decrease was on the month of November with 28.29 %.

Figure 2 is the graphical presentation of the average farmgate price and monthly percentage changes of carrot price for the past ten years. It was noticed that highest peak of farmgate price for the past ten years was on October and the lowest was on the month of April. Farmgate price of carrots was low for the first four months and started to go upward from May until October. A downward movement of price was noticed from the month of November until December. The reason for such downward movement of price is the expectation of the farmers that there is an increase of price during holidays like Christmas holiday. Farmers from the three carrot-producing provinces of the Cordillera program their production in such a way that they would harvest their carrots during these periods, however, this usually resulted to oversupply of the said commodity in the market leading to lower prices.



Table 2. Average farmgate price and monthly percentage price changes, 2001-2010

MONTHS	AVERAGE PRICE	PERCENTAGE CHANGES
January	11.38	
February	10.54	(7.37)
March	10.41	(1.23)
April	10.32	(0.87)
May	13.90	34.71
June	16.82	21.01
July	16.78	(0.24)
August	19.62	16.92
September	22.19	13.13
October	26.14	17.76
November	18.75	(28.29)
December	16.69	(10.94)

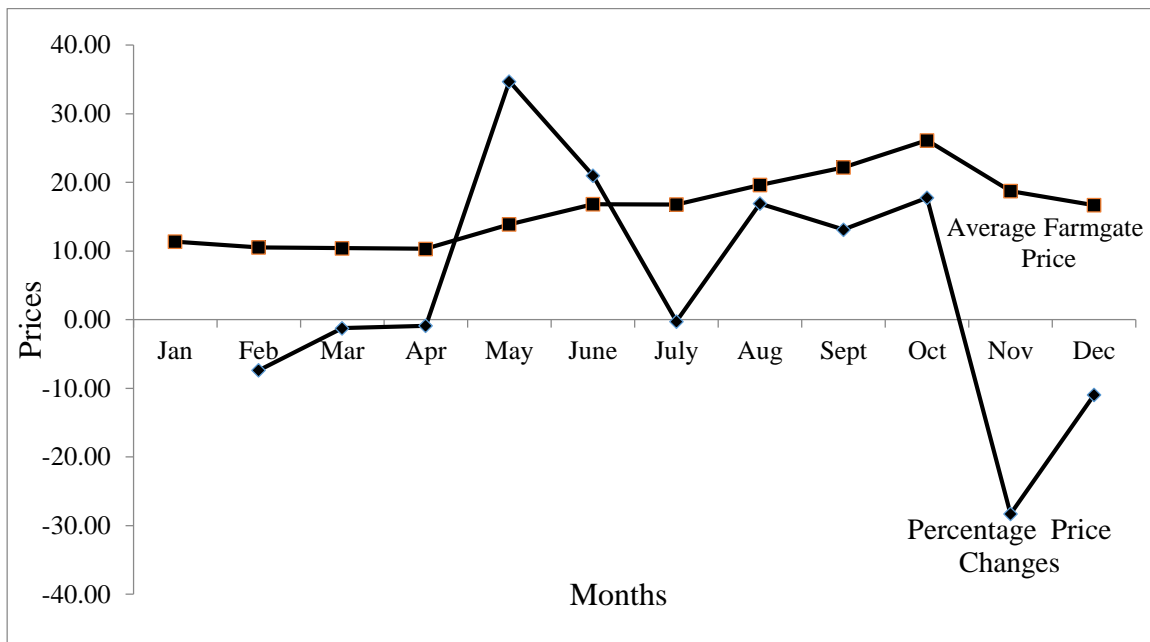


Figure 2. Graphical presentation of average farmgate price and monthly percentage changes of carrot price for 2001-2010



Wholesale Prices of Carrots

Table 3 presents the actual data of monthly average wholesale price for the past ten years (2000-2010). It was observed that the lowest wholesale price was recorded on February of 2001 at Php 9.49 per kilogram. Highest price was noted on October of 2009 at Php 63.98 per kilogram. Carrots were cheap in year 2001 and expensive in 2009 according to the annual average wholesale prices.

Figure 3 is the graphical presentation of the actual data of wholesale prices. It shows that there was an erratic movement of prices except for the first four months of year 2001, 2002, 2004 2006, and 2010 where there was a little movement of the prices. The figure also shows that movement of price follows the same direction from January to December except for December of year 2005 and 2007 where there was an upward movement of price.



Table 3. Monthly average wholesale prices of carrots, 2001-2010 (Actual Data)

MONTHS	YEAR										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Ave.
January	21.32	-	13.34	12.42	26.55	27.2	16.43	38.09	23.78	17.82	21.88
February	14.9	15.92	20.66	9.49	28.2	19.02	17.75	25.91	23.53	15.73	19.11
March	13.4	14.93	25.97	11.08	29.74	14.2	19.6	20.47	30.48	14.57	19.44
April	11.32	15.42	33.36	11.8	22.28	13.15	21.22	22.47	31.4	14.11	19.65
May	12.83	17.76	39.33	15.24	15.83	15.4	36.97	24.82	39.56	17.49	23.52
June	14.29	19.2	43.15	19.58	16.55	18.28	52.5	34.49	50.55	27.25	29.58
July	15.07	51.37	36.13	49.06	24.29	26.33	27.03	39.82	42.51	36.43	34.80
August	-	29.11	27.65	56.43	15.05	32.97	27.06	40.04	46.85	40.06	35.02
September	27.6	19.1	26.7	51.82	16.43	42.13	24.65	51.66	61.69	30.11	35.19
October	36.43	24.98	35.38	47.17	35.87	47.38	28.58	40.35	63.98	29.4	38.95
November	29.69	23.73	19.73	20.48	28.71	39.45	32.8	40.3	62.42	29.58	32.69
December	25.98	17.22	17.62	19.88	37.4	25.36	44.56	32.08	45.47	27.8	29.34
Average	20.26	22.61	28.25	27.04	24.74	26.74	29.10	34.21	43.52	25.03	28.27



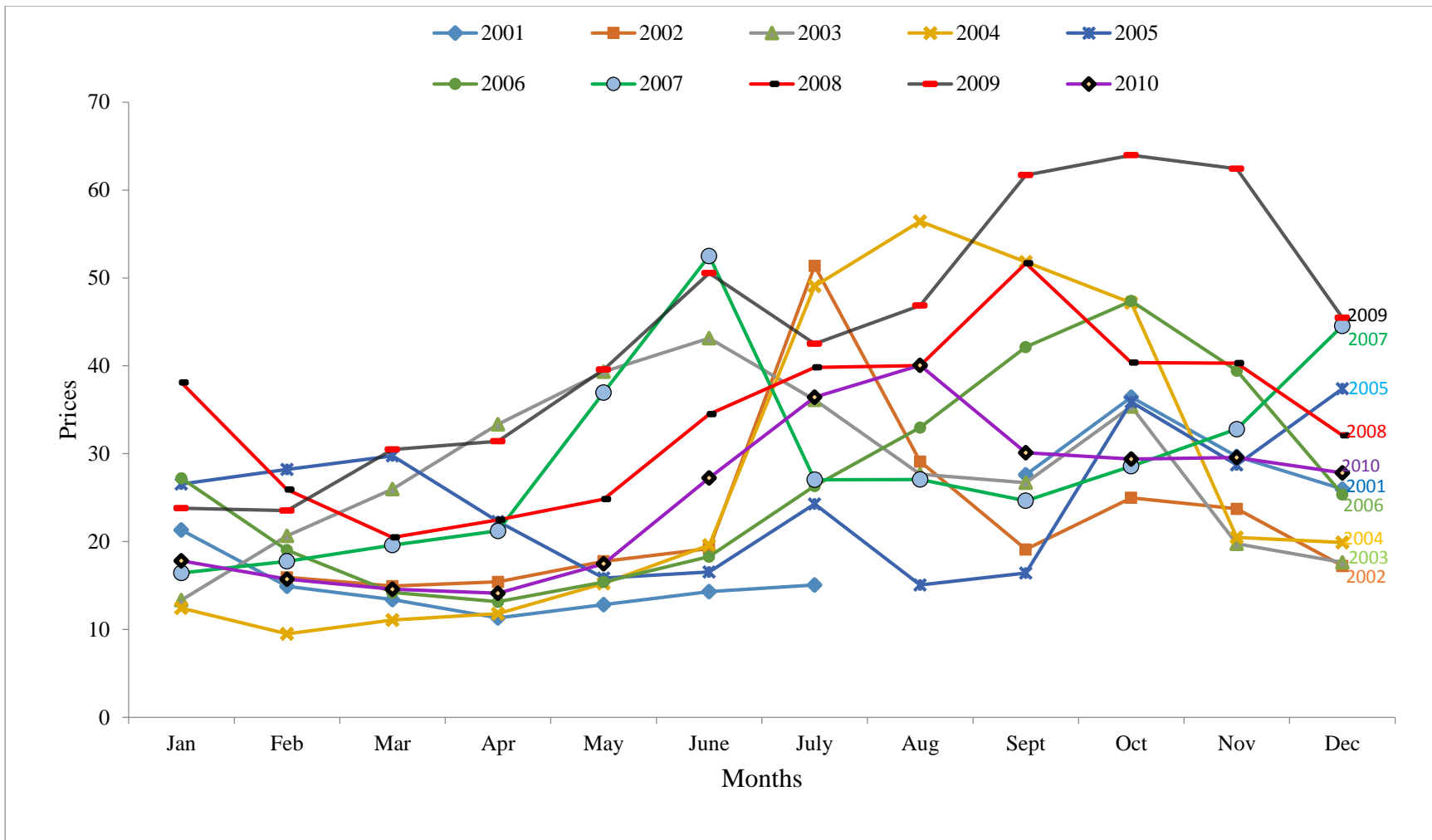


Figure 3. Monthly average wholesale prices of carrots, 2001- 2010



Table 4 presents the average wholesale price and computed monthly percentages of price changes of carrot for the past ten years (2000-2010).

Figure 4 shows the average wholesale price and monthly percentage rate of price changes for the past ten years. The figure shows that prices were low for the first four months and starts to rise up for the month of May until July. It was observed that price was stable from July to September. Highest price was recorded on the month of October for the past ten years and the lowest price was recorded on the month of February.

The highest increase in wholesale price for the past ten years was observed on the month of June with 25.77 % increase. Lowest price decrease was noted on the month of November with -16.08 % as shown in Table 4.



Table 4. Average wholesale price and monthly percentage changes for 2001-2010

MONTHS	AVERAGE PRICE	PERCENTAGE CHANGES
January	21.88	
February	19.11	(12.67)
March	19.44	1.74
April	19.65	1.07
May	23.52	19.69
June	29.58	25.77
July	34.80	17.64
August	35.02	0.63
September	35.19	0.47
October	38.95	10.69
November	32.69	(16.08)
December	29.34	(10.25)

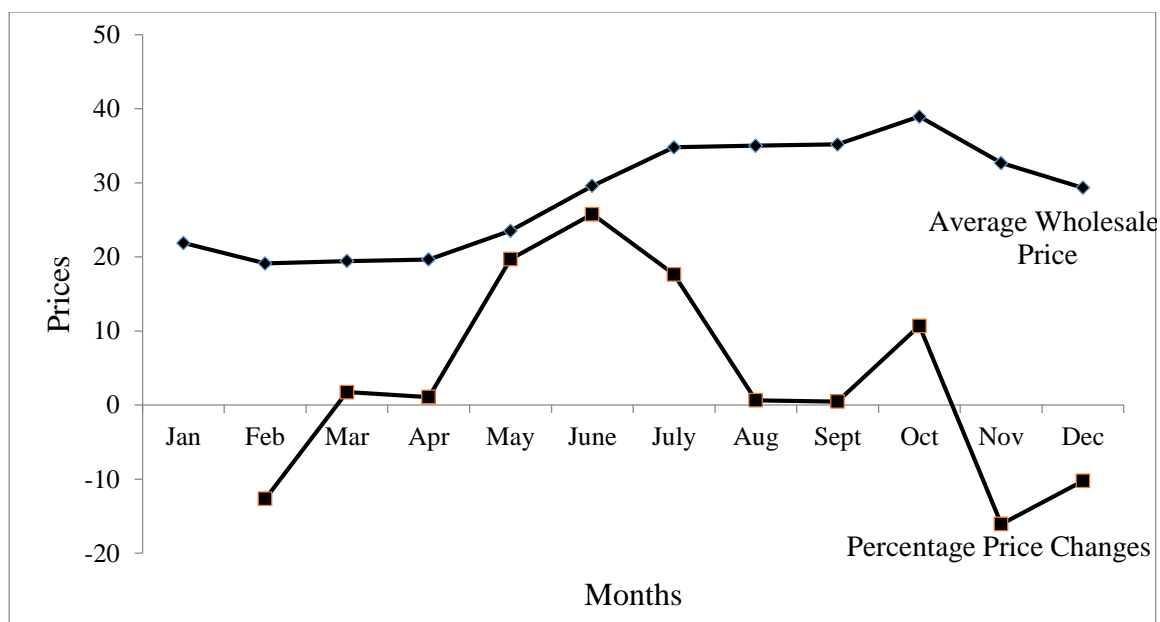


Figure 4. Graphical presentation of average wholesale price and monthly percentage changes of carrot price for 2001-2010



Retail Prices of Carrots

Table 5 shows the actual monthly average retail price of carrots for periods 2001-2010. It was noticed that the recorded lowest retail price was on January of year 2004 at Php 24.5 per kilogram. The highest retail price recorded was on October of year 2009 at Php 94.09 per kilogram. Cheapest carrots prices were noticed in the year 2003 and expensive in 2009.

Figure 5 shows the trend of actual retail prices of carrots. It was observed that it follows the same pattern except for the month of December of year 2007 and 2010 where there was an upward movement of price as compared to other years. It was noticed that there was little movement of prices from the month of December until May.



Table 5. Monthly average retail prices of carrots, 2001-2010 (Actual Data)

MONTHS	YEARS										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Ave.
January	37.43	28.5	28.33	24.5	46	39.08	29.36	53.17	31.74	28.87	34.70
February	-	28.4	30.83	25.36	39.33	34.7	32.46	42.67	30.93	32.42	33.01
March	27	27.36	34.23	25.1	38.36	29.49	32.46	31.98	38.73	29.54	31.43
April	28.55	31.58	46.5	25.73	36.17	34.85	30.27	32.86	51.18	25.17	34.29
May	32.82	35.62	48	27	31.36	38.45	52.64	34.05	60	33.75	39.37
June	35.31	43.64	58.67	35.5	32.08	36.17	66.42	51.38	64.27	48.67	47.21
July	36.27	60	49.17	61.46	37.58	43.16	50.54	58	58.08	61.17	51.54
August	-	54	39.92	75.33	36.31	46.55	46.33	54.96	66.45	60.75	53.40
September	56.9	38	38.17	63.83	36.55	63.36	44.67	69	74.09	55.33	53.99
October	62.46	32	53.17	55.37	45	66.17	49.92	55.92	94.09	55.85	57
November	50.55	32.25	47.09	33.6	49.6	52.67	50.64	49.64	77	54	49.70
December	39.63	31.3	33	32.91	46.24	44.73	68.64	41.8	60	67.45	46.57
Average	40.69	36.89	42.26	40.47	39.55	44.12	46.20	47.95	58.88	46.08	44.35



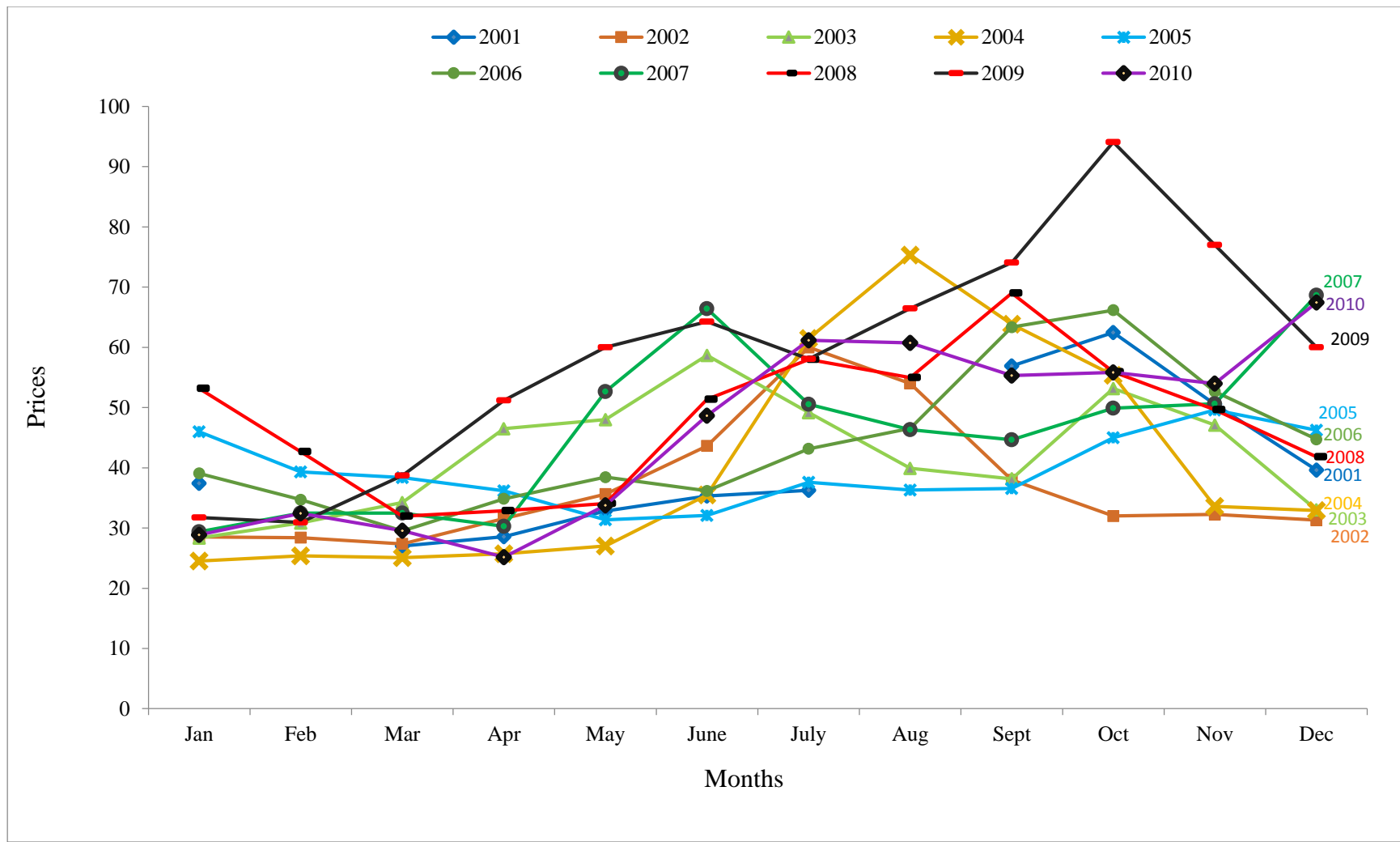


Figure 5. Monthly average retail prices of carrots, 2001-2010



Table 6 and Figure 6 presents the average retail price and monthly percentage of price changes of carrots for the past ten years, it was observed that retail price of carrots was low for the first four months as compared to the other months where the price was high. The figure presents the average retail price of carrots for the past ten years. It shows that there was an upward movement of price starting from May until the month of October and started to go downward until December. According to the figure, it was noticed that month of October recorded the highest retail price for the past ten years and lowest price was on the month of March.

Highest price increase in retail price for the past ten year was on the month of June with 19.92 % increase and the lowest price decrease was on the month of November with negative 12.79 % showed in Table 6.

Table 6. Average retail price and monthly percentage changes for 2001-2010

MONTHS	AVERAGE PRICE	PERCENTAGE CHANGES
January	34.70	
February	33.01	(4.86)
March	31.43	(4.80)
April	34.29	9.10
May	39.37	14.83
June	47.21	19.92
July	51.54	9.18
August	53.40	3.60
September	53.99	1.10
October	57	5.57
November	49.70	(12.79)
December	46.57	(6.31)



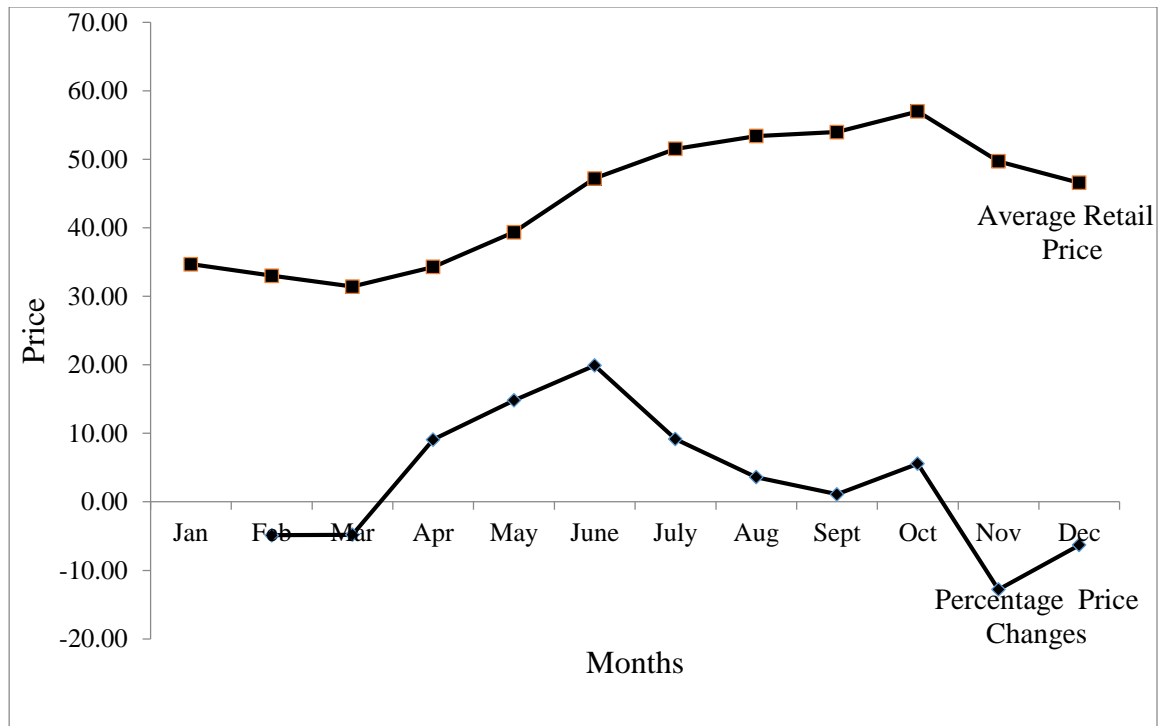


Figure 6. Graphical presentation of average retail price and monthly percentage of price changes of carrots for 2001-2010

Based from observations, another reason for the rise and fall of price was due to the weather condition of the place. Prices of carrots were quite low from January to May as compared to the rest of the months because during these months is the period for dry season that favors the carrot production of most of the farmers. And starting from June up to December prices were higher because this is the period for wet or rainy season wherein most of the crops of the farmers are being destroyed by typhoons. Added to that is the destruction of farm to market roads caused by these calamities that resulted to the difficult transportation of the harvested agricultural commodities like carrots. It could be recalled that in the latter part of year 2009, Cordillera, experienced two consecutive super typhoons that caused damaged to the life of the Cordillerans. Vegetable farms were destroyed due to landslides and flash floods. Crops planted were drowned due to heavy rains. And prices of



all commodities went high. Furthermore, the cropping pattern of the farmers also affects carrots prices. Most of them do not maintain production calendar that would guide them to identify the best season to plant carrots and the best season to harvest at the time the price is high.

Factors Affecting the Price Changes

A. Volume of Supply

Table 7 shows the volume of supply of carrots from the three carrot - producing provinces of CAR for 2001-2010.

Figure 7 is the graphical presentation of the actual data for volume of supply. The figure displays that Benguet has the highest volume of supply of carrots. This is attributed to the fact that it has the largest production area of carrots among the three provinces. Volume of carrot supply from the three producing areas in CAR exhibited constant increases for the ten year coverage period, although very small decreases were noted for the periods 2005 and 2009 (Table 7), with decreases of 0.36% and 2.12%, respectively.

A significant increase could be noted for the period 2007 where the total volume of supply of carrots more than doubled with 105.57% increase from that of the previous period. This could be attributed to the significant increase in the production areas for carrots in CAR.



Table 7. Yearly volume of supply of carrots (mt), 2001-2010 (Actual Data)

YEAR	BENGUET	MT. PROVINCE	IFUGAO	TOTAL VOLUME	PERCENTAGE CHANGES
2001	25,134.77	1,224.50	115.65	26,474.92	1.58
2002	25,376.19	1,402.50	113.85	26,892.54	1.93
2003	25,744.83	1,554.00	113.19	27,412.02	2.30
2004	26,106.21	1824.40	112.78	28,043.39	(0.36)
2005	25,795.37	2034.40	112.99	27,942.76	0.08
2006	25,754.84	2098.60	113.05	27,966.49	105.57
2007	50,936.76	6193.78	360.00	57,490.54	4.89
2008	52,918.80	6790.78	593.19	60,302.77	(2.12)
2009	52,617.46	5838.41	567.90	59,023.77	7.33
2010	57,706.04	5127.50	519.00	63,352.54	1.58

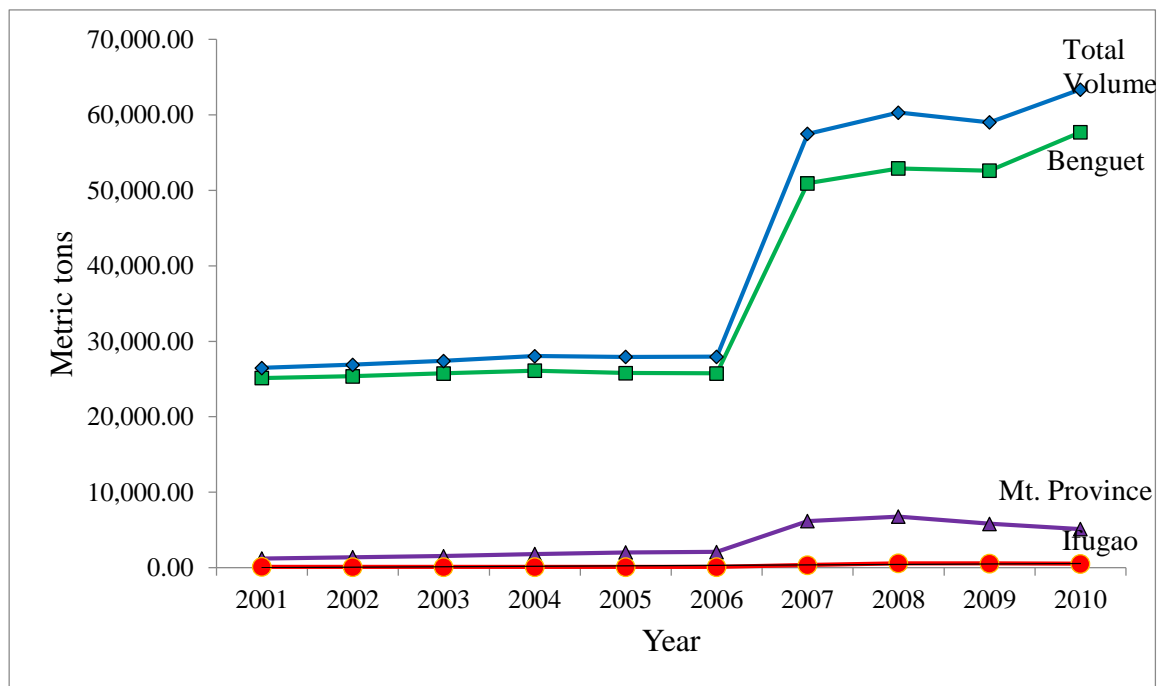


Figure 7. Total supply volume of carrots by province for 2001-2010



Table 8. Correlation analysis results between the volume of supply of carrots and prices

PRICES	TOTAL VOLUME	
	Correlation (r)	Probability
Farmgate	.391 ^{ns}	.132
Wholesale	.607 [*]	.031
Retail	.750 ^{**}	.006

* - significant

** - highly significant

ns – not significant

Based from Table 8, volume supply of carrots from the three provinces does not affect the price changes in farmgate price but it does affect the changes in wholesale and retail prices. As indicated by the computed values of significance (r), a positive moderate to high correlation or direct correlation between the volume of supply and the prices was observed which means that an increase or decrease in volume of supply would result also to a decrease or increase in price (wholesale and retail).

B. Production Area

Figure 8 is the graphical presentation of the production area of carrots for the Cordillera Administrative Region. It reveals modest increases from 2001 to 2006 which was attributed to the increasing production area in Mt. Province.

A significant increase in the production area was noted in 2007 with 82.32% showed in Table 9. Farmers in all the three producing provinces in CAR devoted larger portions farms in the production of carrots in the said year. For the succeeding years (2008-2010), production areas continued to increase although at moderate rates.



Table 9. Yearly production area of carrots (ha), 2001-2010 (Actual Data)

YEAR	BENGUET	MT. PROVINCE	IFUGAO	TOTAL AREA	PERCENTAGE CHANGES
2001	1589	127	11	1727	1.33
2002	1589	150	11	1750	1.09
2003	1596	162	11	1769	0.90
2004	1596	178	11	1785	0.56
2005	1596	188	11	1795	(0.11)
2006	1589	193	11	1793	82.32
2007	2788	451	30	3269	3.46
2008	2800	533	49	3382	(0.27)
2009	2795	529	49	3373	2.37
2010	2926	479	48	3453	1.33

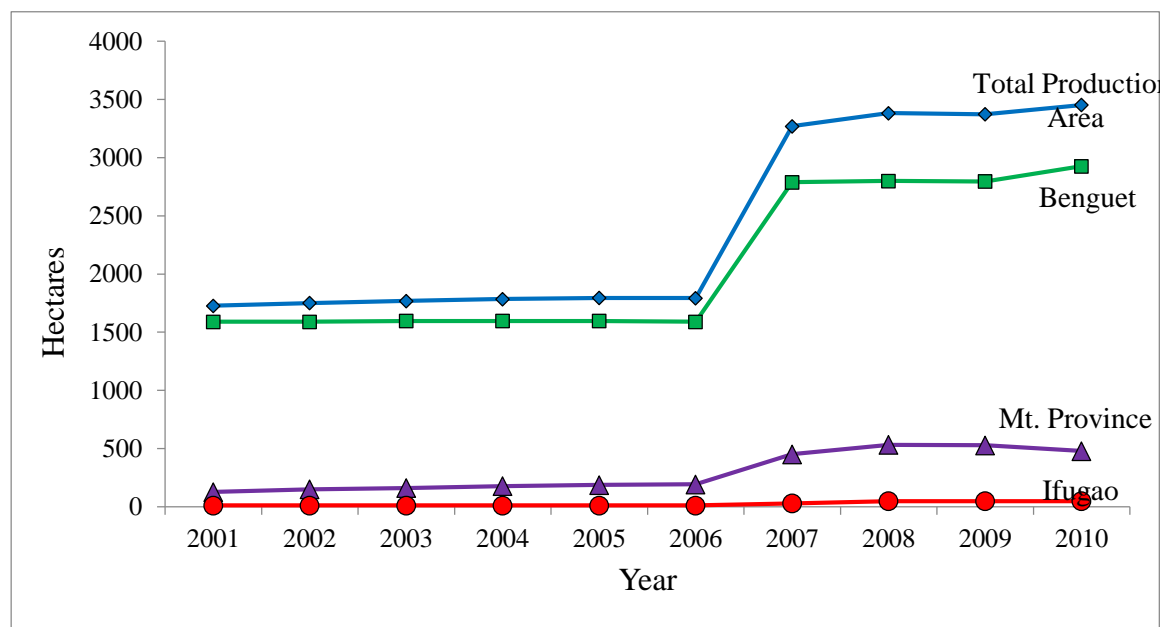


Figure 8. Total production area of carrots by province for 2001-2010



Table 10. Correlation analysis results between the production area and prices

PRICES	TOTAL PRODUCTION AREA	
	Correlation (r)	Probability
Farmgate	.414 ^{ns}	.117
Wholesale	.629 [*]	.026
Retail	.766 ^{**}	.005

* - significant

** - highly significant

ns – not significant

Based from the correlation analysis results (Table 10), production area of carrots from the three provinces has no significant effect on the changes in farmgate price. But it affects the changes in wholesale and retail price. A positive moderate to high relationship or direct correlation between the production area and price was observed as indicated by the computed values of significance (r). It means that a decrease or increase in production area would result also to an increase or decrease in price (wholesale and retail).

Forecasted Prices of Carrots

There were four models for forecasting trend namely: linear, quadratic, exponential and logarithmic. The model that approximately fitted the observed data was the exponential trend model since it has the lowest Mean Absolute Percentage Error (MAPE) among the four trend forecasting models and was used to forecast the different prices for 2011-2015. It was observed that the forecasted prices display an upward trend.



$$Y_t = \beta_0 * \beta_1^t * e_t$$

Where: β_0 = intercept of the regression line

β_1^t = slope of the line

e_t = residuals

Table 11 shows the computed forecasts of farmgate prices for periods 2011-2015. Using the model $Y_t = 10.628*(1.00433^{**t})$, the values were obtained. It was observed that the forecasted farmgate prices from January to December of year 2011 ranges from Php 17.92 to 18.79 per kilogram, Php 18.87 to 19.79 per kilogram from January to December of year 2012. Php 19.88 to 20.84 per kg for year 2013, Php 20.93 to 21.95 per kilogram of year 2014 and Php 22.04 – 23.12 per kg for year 2015.

Figure 9 is the graphical presentation of the computed forecasts of farmgate price. It shows that the trend direction is upward.

Table 11. Computed forecasts of the monthly farmgate prices of carrots

MONTHS	YEAR				
	2011	2012	2013	2014	2015
January	17.9189	18.8716	19.8750	20.9317	22.0446
February	17.9965	18.9533	19.9610	21.0223	22.1400
March	18.0743	19.0353	20.0474	21.1132	22.2358
April	18.1525	19.1176	20.1341	21.2046	22.3320
May	18.2310	19.2003	20.2212	21.2963	22.4286
June					



	18.3099	19.2834	20.3087	21.3884	22.5256
MONTHS	YEAR				
	2011	2012	2013	2014	2015
July	18.3891	19.3668	20.3965	21.4810	22.6231
August	18.4687	19.4506	20.4848	21.5739	22.7209
September	18.5486	19.5348	20.5734	21.6672	22.8192
October	18.6288	19.6193	20.6624	21.7610	22.9180
November	18.7094	19.7042	20.7518	21.8551	23.0171
December	18.7904	19.7894	20.8416	21.9497	23.1167

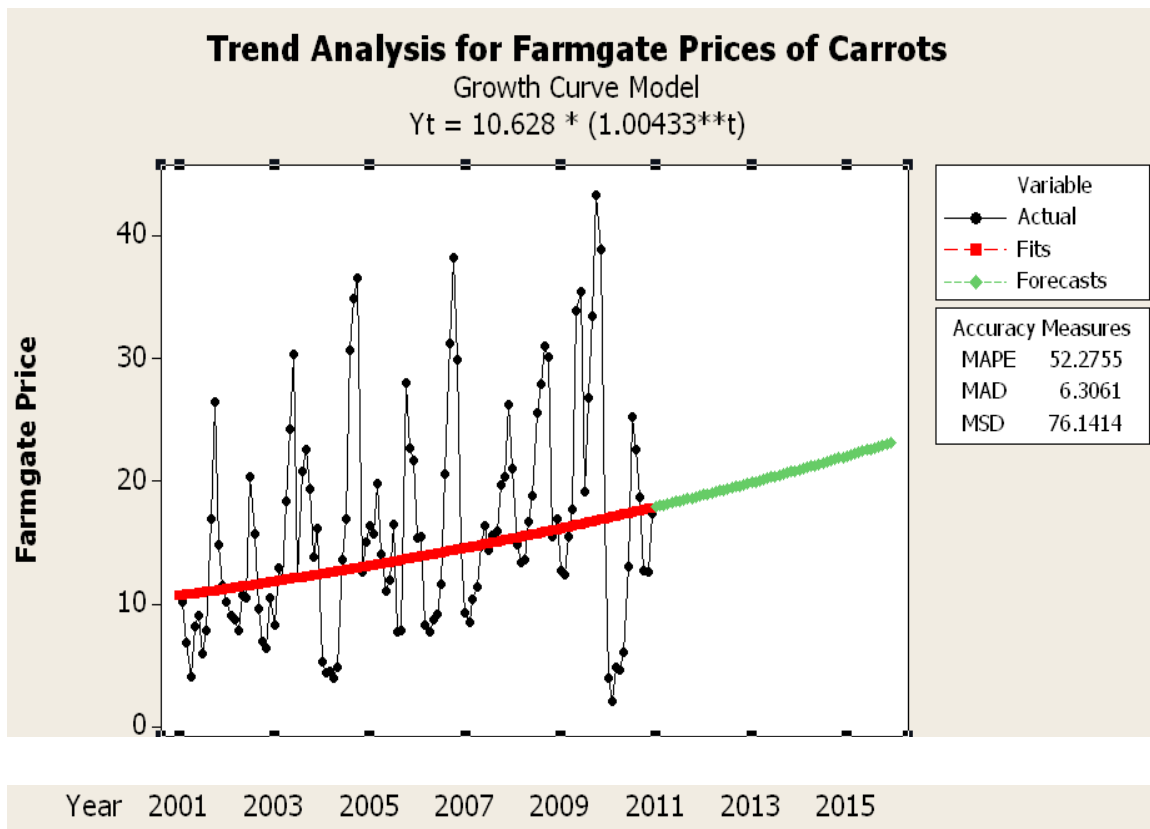


Figure 9. Monthly trend forecasts of farmgate prices for carrots, 2011-2015

Table 12 presents the computed forecasts of wholesale prices of carrots for periods 2011 to 2015. The model $Y_t = 19.0839 \cdot (1.00483^{**t})$ was used to forecast the wholesale prices. The forecasted wholesale prices of carrots for January to December of year 2011 ranges from Php 34.20 to 36.06 per kilogram. Php 36.23 to 38.20 per kilogram for year 2012; Php 38.39 to 40.48 per kilogram of year 2013; Php 40.68 to 42.89 per kilogram of carrot for year 2014; and Php 43.10 to 45.44 per kilogram for 2015.

Figure 10 is the graphical presentation of the computed forecasts of wholesale prices of carrots. For periods 2011-2015, an upward trend movement of forecasted wholesale prices was observed.

Table 12. Computed forecast of the monthly wholesale prices of carrots

MONTHS	YEARS				
	2011	2012	2013	2014	2015
January	34.20	36.23	38.39	40.68	43.10
February	34.36	36.41	38.57	40.877	43.31
March	34.53	36.58	8.76	41.07	43.51
April	34.69	36.76	38.95	41.27	43.73
May	34.86	36.94	39.14	41.47	43.94
June					



	35.03	37.12	39.33	41.67	44.15
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MONTHS	YEARS				
	2011	2012	2013	2014	2015
July	35.20	37.29	39.52	41.87	44.36
August	35.37	37.48	39.71	42.07	44.58
September	35.54	37.67	39.90	42.27	44.79
October	35.71	37.84	40.09	42.48	45.01
November	35.88	38.02	40.28	42.68	45.23
December	36.06	38.20	40.48	42.89	45.44



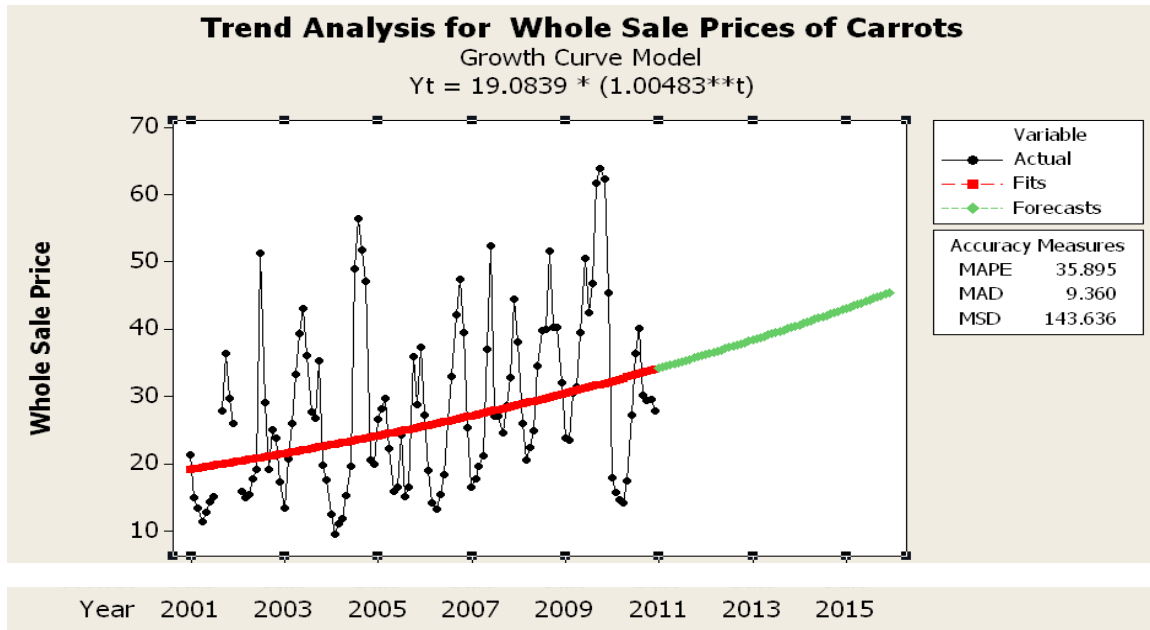


Figure 10. Monthly trend forecasts of wholesale prices for carrots, 2011-2015

Computed forecasts for retail prices for periods 2011-2015 was presented in Table 13. The model used to forecast the retail prices was $Y_t = 34.7011 * (1.00324^{**t})$. The forecasted retail prices for January to December of year 2011 ranges from Php 51.31 to 53.16 per kilogram of carrots. Php 53.33 to 55.26 per kilogram for year 2012. Php 55.44 to 57.44 per kilogram of year 2013. Php 57.63 to 59.72 per kilogram and Php 59.91 to 62.08 per kilogram of carrot for year 2014 and 2015, respectively;

Figure 11 is the graphical presentation of the computed forecasts of retail prices. It was observed that the trend direction is upward.



Table 13. Computed forecast of the monthly retail prices of carrots

MONTHS	YEAR				
	2011	2012	2013	2014	2015
January	51.31	53.3334	55.4413	57.6326	59.9104
February	51.47	53.5059	55.6207	57.8190	60.1042
March	51.64	53.6791	55.8007	58.0061	60.2987
Apr	51.81	53.8527	55.9812	58.1938	60.4938
May	51.97	54.0270	56.1623	58.3820	60.6895
June	52.14	54.2018	56.3440	58.5709	60.8859
July	52.31	54.3771	56.5263	58.7604	61.0829

MONTHS	YEAR				
	2011	2012	2013	2014	2015
August	52.48	54.55	56.7092	58.9506	61.2805
September	52.65	54.73	56.8927	59.1413	61.4788
October	52.82	54.91	57.0768	59.3326	61.6777
November					



	52.99	55.08	57.2614	59.5246	61.8772
December	53.16	55.26	57.4467	59.7172	62.0774

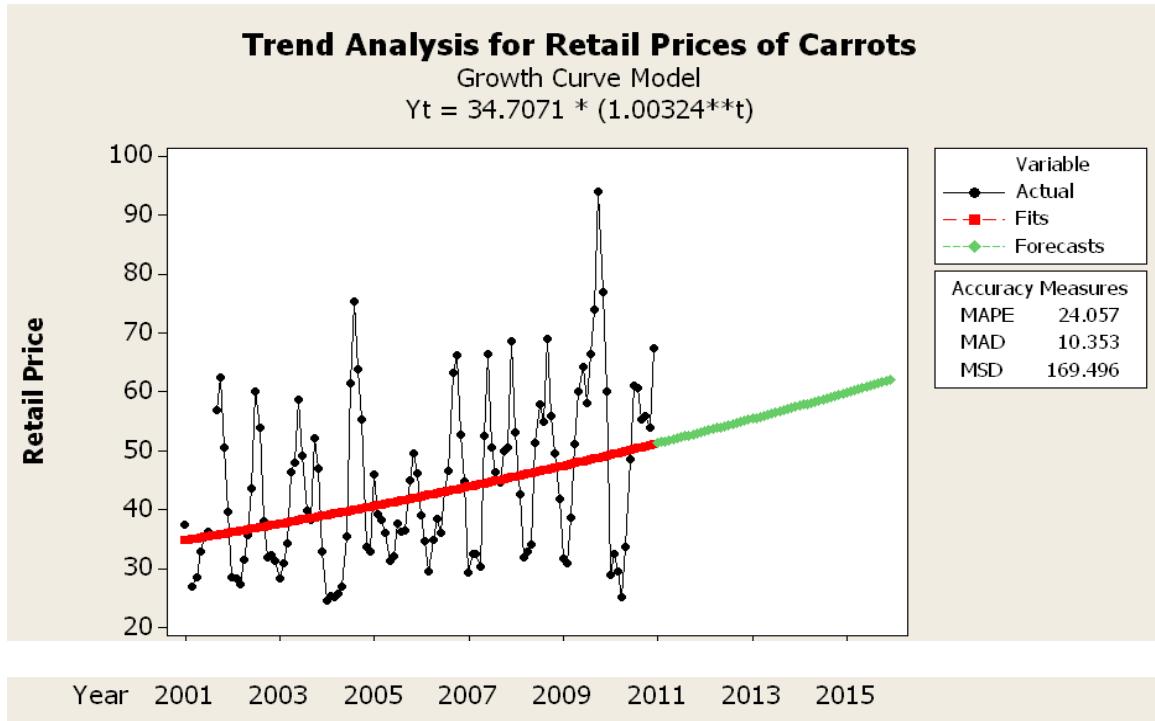


Figure 11. Monthly trend forecasts of retail prices for carrots, 2011-2015

It was that there is a slightly increase in the forecasted farmgate, wholesale and retail prices. It was the month of December has the highest forecasted prices of carrots in all the periods covered.



SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study aimed to present the movement of prices of carrots at the La Trinidad Vegetable Trading Post and the factors that affect the price changes of carrots urged for the study to be conducted. Data on prices of carrots, production area and volume supply of carrots from the three major producing provinces in the Cordillera namely; Benguet, Mt. Province and Ifugao were gathered personally by the researcher from the Bureau of Agricultural Statistics Office (BAS-Benguet); other data were downloaded from the website of the said bureau.

Farmgate, wholesale, and retail prices of carrots for the past ten years (2001-2010) were low during the first five months and it became higher starting from June until December. It was only the month of October where price of carrots reached its highest peak. The rise and fall of prices was because of the weather condition, expectation of farmers and cropping pattern of the farmers.

The month of April had the highest computed monthly percentage changes in farmgate price for the past ten years. For the wholesale and retail prices, the highest increase in price was on the month of June and the lowest decrease in price was on the month of November for farmgate, wholesale and retail.

There was a significant effect of the production area and volume of supply of carrots to the changes in wholesale and retail price as indicated by positive computed values of correlation. A moderate to high correlation was observed from the computed values of correlation which means that an increase or decrease in production area and



volume of supply of carrots would result also to a decrease or increase in price (wholesale and retail).

The model that fitted to the observed data was the exponential trend model among because it has the lowest mean absolute percentage error (MAPE). It was observed that there was a slightly increase in the computed monthly forecast of prices and it displays an upward trend.

Conclusions

Based from the findings, the following conclusions were drawn:

1. The highest price of carrots was recorded on the month of October for the periods 2001 to 2010. Prices were generally high in year 2009.

2. The movement of prices follows the same pattern from January to December in all the periods.

3. The periods where the prices of carrots were usually high from June to November and starts to decline from December until the month of May in all years.

4. Production area and volume of supply of carrots from the three carrot-producing provinces has no significant effect to the changes in farmgate prices but has significant effect to the changes in prices (wholesale and retail). This was caused by the low farmgate prices as compared to wholesale and retail prices. Traders bought the carrots from the farmers at a low price but they sold it to other wholesalers with at a higher price. Traders were the one who benefited most and not the farmers who produced the carrots.



Recommendations

Based on the conclusions of the study the following are recommended:

1. For the farmers to become profitable entrepreneurs and not just as farmers, they should form a cooperative or a group that would help them to market their products whether the price is high or low, as cited by APO, cooperative marketing of products enables farmers to have strong bargaining power than to market their products individually.

2. The Department of Agriculture should supervise or implement the production of carrots by province per cropping season. Provided that the other farmers belong to the provinces that do not produce carrots during the cropping season will still have an income through the subsidiary provided by the said agency.

3. Department of Agriculture or other concerned agencies should provide a data of forecasted prices of agricultural commodities as a guide/basis for production activities of the producers and marketing activities of the consumers.

4. There should be further studies to be done to know the other factors that affect the price changes not only for carrots but for the other agricultural commodities.



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