Projected Public Expenditure on Police Services –A Case Study of Gujrat State

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Abstract

Public expenditure bears the responsibility for sustained economic development. Internal disturbances and high crime rates prove detrimental to the economic health of a nation. The present study is an attempt to ascertain the future trends of crime and public expenditure on police services in Gujrat up till 2023.

The total police expenditure is highly dependent on total crime in the Gujrat state and moreover both these variables have high degree of correlation to the extent of 0.82. Lastly some suggestions were made. Future research unit must be established at Gujrat Police Headquarters. Through the use of environmental scanning and analytical examining the right data with appropriate forecasting methods, the future research unit produces forecasts and policy options that allow police department to improve the odds of preferable future from among the many existing alternatives.

INTRODUCTION

Public expenditure bears the responsibility to create a suitable personal, social & business friendly environment so as to promote investment in an economy. Internal disturbances and high crime rates prove detrimental and create hurdles in the path of economic development. Most of the nations facing such problems are incurring huge public expenditure on maintaining defense and internal security. Even **Adam Smith** advocated that the Government should restrict its activities to justice, police and arms.

In the economic literature, there are several contradictory hypotheses concerning the behaviour of public internal security expenditures. Starting from a basically pessimistic view of the nature of man, **Adolph Wagner** believed that the ratio-income-elasticity for internal security expenditures is greater than zero because of the increasing social strains arising from urbanization and the increasing need for judicial settlement of disputes stemming from the ever-growing complexity of life. On the supply side, relations between the volume of expenditures on police or the number of police personnel and their ostensible effects are quite complex. Certain intricacies can be seen by looking at two dimensions of such effects: the suppression of political opposition to the Government (Police terror) and the prevention of crime (Pryor, 1968).

Economic liberalization and the impact of technological development on crime and its control are the key factors, which guide the future of policing in India. These developments will force the police to engineer it in line with the police systems in the developed countries. Police will have to transform itself into a truly community oriented and service minded agency. Conventional crimes will give way to economic and white-collar crimes. To deal with this situation not only a more professional, specialised and intelligent police force would be required but a

competent judiciary and a set of lawyers who understand the subtle nuances of these new forms of crime are also needed. (Kosby, 1988)

The pressure of population and scarcity of resources in the next millenium is going to give rise to criminality and criminal tendencies, particularly among the younger lots, causing innumerable pressures on the law and order maintenance. (Dutta, 1999) With the accentuation of social tensions and fissiparous tendencies, there has been a tremendous growth in the commitments of police quantitatively as well as qualitatively. (Aujla, 2001) It is a matter of concern that an attitude is fast developing that any illegitimate act is possible, through money and patronage. Excise laws are flouted because the spoils are shared with the same people, who are to implement the excise laws. Civil disputes are settled outside courts, by threat and coercion because this is only what works. There are umpteen examples of such nature. (Dutta, 1999)

Another possibility is the change in the very nature of crime. The pattern of incidence of crime depends on the nature of economy. In agrarian societies crime centered around land, agricultural produces and implements while in industrial societies crimes relates to industry, its produces etc. With the advent of what **Alvin Toffler** calls the Third Wave or the Information Revolution, crimes would also witness a shift towards the field of Information Technology and its products. Classified information regarding credit card numbers and activities of customers, bank accounts and balances, information regarding the internal finances of companies and state secrets or defense computers would become targets of crime and the cost of each crime would become astronomically high. (Kosby, 1988)

Police is trained to take up conventional crimes like thefts and burglaries which even today are the most important crimes and for which an average police personnel spends most of his time, will pale into insignificance on account of both value and importance of stolen property. One scam can result in the loss of several hundreds of crores of Rupees, amounting to more that the combined value of all stolen property throughout the country. Economic crimes and white-collar crimes would therefore become more important than traditional property crimes. Police would have to evolve newer forms of surveillance, prevention and detection of these new types of crime. Services of specialists like chartered accountants, computer programmers, bankers, exporters and share brokers would have to be demanded into service in police work. The instances of kidnapping have been increasing. The years ahead are going to witness increasing criminals, politicians and bureaucrats' nexus. There is growing communalism and casteism causing tension in the society.

The influence of police expenditures on the suppression of crime and its implications is a difficult topic for analysis. It seems intuitively clear that the existence of a large police force physically discourages certain types of crime. But it is also evident that there are many social and psychological factors that may play even more important role. On the other hand any spurt in crime rate calls for higher expenditure on police. The present study is an attempt to ascertain the future trends of crime and police expenditure in Gujrat up till 2023.

METHODOLOGY

The data of police expenditure was subjected to primarily tabular and graphical analysis. The total police expenditure was deflated at 2003-04 constant prices using wholesale price index. The projections of police expenditure from 2014 to 2023 were made on the basis of total crimes during the period 1994-2013. The time period from 1984 to 1993 was not considered for making projections because this was an exceptional period as Gujrat state faced a brunt of terrorism accompanied by sharp growth in crime rate. The magnitude of police expenditure and quantum of police force depends upon many political, social, psychological and economic factors, some of which are quantifiable whereas others are not. Even if they can be quantified, it is not possible to give an exact numerical weightage to all the factors.

Total crime is classified under two categories

(i)   Cognizable (Sec. 2(c) Cr. P.C.)

(ii)   Non-Cognizable (Sec 2(1) Cr. P.C.)

Cognizable crimes are broadly categorized as those falling either under the 'Indian Penal Code' (I.P.C.) or under 'Special and Local' Laws (SSL).

Broad classification of crimes under the Indian Penal Code is as under:

i)   **Violent crimes: -** It includes murder, attempt to commit murder, culpable homicide not attempting to murder, rape, kidnapping and abduction, dacoity, preparation and assembly for dacoity, robbery, riots, arson, dowry deaths.

ii)   **Economic crimes:** - It includes criminal breach of trust, cheating and counterfeiting.

iii)   **Property crimes:** - It includes burglary and theft.

iv)   **Other I.P.C. crimes: -** It includes hurt, molestation, sexual harassment, cruelty by husband and relatives, importation of girls, causing death by negligence and all other I.P.C. crimes.

Several special laws and local laws have been enacted from time to time to meet the growing crime prevention needs. They are broadly categorized as:

a.   Special laws (vide section 41 of I.P.C.) which is applicable to a particular subject.

b.   Local laws (vide section 42 of I.P.C.) which is applicable to a particular part of India.

    i.   Arms Act
    ii.   Narcotic Drugs and Psychotropic Substances Act
    iii.   Gambling Act
    iv.   Excise Act
    v.   Prohibition Act
    vi.   Explosives and Explosive Substances Act
    vii.   Immoral Traffic (Prevention) Act
    viii.   Indian Railways Act
    ix.   Registration of Foreigners Act
    x.   Protection of Civil Rights Act
    xi.   Indian Passport Act
    xii.   Essential Commodities Act
    xiii.   Terrorist and Disruptive Activities Act
    xiv.   Dowry Prohibition Act
    xv.   Child Marriage Restraint Act
    xvi.   Indecent Representation of Women (P) Act
    xvii.   Copyright Act
    xviii.   Sati Prevention Act
    xix.   S.C./S.T. (Prevention of Atrocities) Act
    xx.   Forest Act
    xxi.   Other crimes (not specified above) under Special and Local Laws including **Cyber Laws** under Information Technology Act (I.T.), 2000.

It is not possible to assign weight-age to various types of crime. Hence the sum total of all types of crime is taken into consideration.

Total crime depends upon large number of factors like population, urbanization, migration, unemployment, level of literacy etc and hence assumed to follow normal distribution. Various trends like quadratic, cubic, exponential, geometric trends were tried and choice of the best fit was made on the basis of

i)   Highest value of R^2,

ii)   Value of Durban Watson statistics, linear trend was found to be most suitable.

Linear trend was found to be most suitable and was estimated by principle of least square using following formula.

$$Y = \hat{a} + \hat{b}x$$

Where Y = Police expenditure

X = number of violent crimes or number of total crimes

$$\hat{b} = \frac{n\,\Sigma xy - (\Sigma x)\,(\Sigma y)}{n\,\Sigma x^2 - (\Sigma x)^2}$$

$$\hat{a} = \frac{\Sigma y}{n} - \frac{b\Sigma x}{n}$$

The values of standard error of $\hat{a}$ and $\hat{b}$ were computed using following formula to test their significance

$$SE(\hat{b}) = \sqrt{\hat{\sigma}^2 \; \frac{1}{\Sigma(x-\bar{x})^2}}$$

$$SE(\hat{a}) = \sqrt{\hat{\sigma}^2\left(\frac{1}{n} + \frac{\bar{x}^2}{\Sigma(x-\bar{x})^2}\right)}$$

where $\hat{\sigma}^2 = \dfrac{\Sigma(y-\bar{y})^2 - b^2\,\Sigma(x-\bar{x})^2}{n-2}$

and value of t was computed as under

$$t = \frac{\hat{b}}{SE(\hat{b})}$$

The standard error of the forecast for single equation model is given by

$$SE(\hat{Y}_F) = \hat{\sigma}_\mu^2 \cdot \sqrt{1 + \frac{1}{n} + \frac{(x_F - \bar{x})^2}{\Sigma(x-\bar{x})^2}}$$

Where $\hat{\sigma}_\mu^2$ = Estimate of the variance of $\mu = \dfrac{\Sigma e^2}{(n-K)}$

n = size of the sample.
X_F = value of x assumed in the period of the forecast.
The 95 percent confidence interval for the true forecast is

$$(\hat{Y}_F) \pm (t\,0.025) \left\{ \hat{\sigma}_\mu^2 \cdot \sqrt{1 + \frac{1}{n} + \frac{(x_F - \bar{x})^2}{\Sigma(x-\bar{x})^2}} \right.$$

RESULTS AND DISCUSSION

Predicting future course of police expenditure is always a very difficult and risky venture. We have no control over future and what we predict is based on the limited information available to us, which can be, rendered obsolete even by a single turn of event. What can, however, be done with a fair amount of accuracy is to predict the possible trends and their consequences assuming the situation to remain normal. Economic liberalization and the impact of technological development on crime and its control are the key factors, which guide the future of policing in Gujrat State. These developments will force the police to engineer it in line with the police systems in the developed countries. Maintaining business friendly peaceful environment is a precondition for economic sustainable development for which the state must invest a bare minimum in its police force. Therefore projections regarding such expenditure are of great significance and accordingly appropriate budgetary provisions can be made for times to come.

Based on the total crime reported from 1994 to 2013, projected total crime from 2014 to 2023 is given in the table 1.

Table 1: Projected Total Crime in Gujrat (1994-2023)

Year	Total Crime Reported (IPC)	Total Crime Reported (SLL)	Total Crime Reported	Projected Total Crime
1994	112252	228816	341068	273140
1995	123514	214945	338459	276702
1996	123514	214945	338459	280264
1997	117823	137344	255167	283825
1998	117823	137344	255167	287387
1999	124786	153061	277847	290949
2000	115859	152876	268735	294510
2001	103419	153878	257297	298072
2002	106675	157027	263702	307634
2003	103709	160749	264458	305196
2004	105469	167644	273113	308757
2005	113414	174336	287750	312319
2006	120972	171085	292057	315881
2007	123195	194751	317946	319442
2008	123808	200315	324123	323004
2009	115183	213339	328522	326566
2010	116439	218751	335190	330127
2011	123371	221212	344583	333689
2012	130121	232528	362649	337251
2013	157435	255801	413236	340812
2014	---	---	---	344374
2015	---	---	---	347935
2016	---	---	---	351498
2017	---	---	---	355059
2018	---	---	---	358621
2019	---	---	---	362183
2020	---	---	---	365744
2021	---	---	---	369306
2022	---	---	---	372868
2023	---	---	---	376429

Source: Crime in India, National Crime Record Bureau, Ministry of Home. (Various issues 1994 - 2013)

Note: Figures for the years 1996 & 1998 were not available, which are filled by figures of the preceding years.
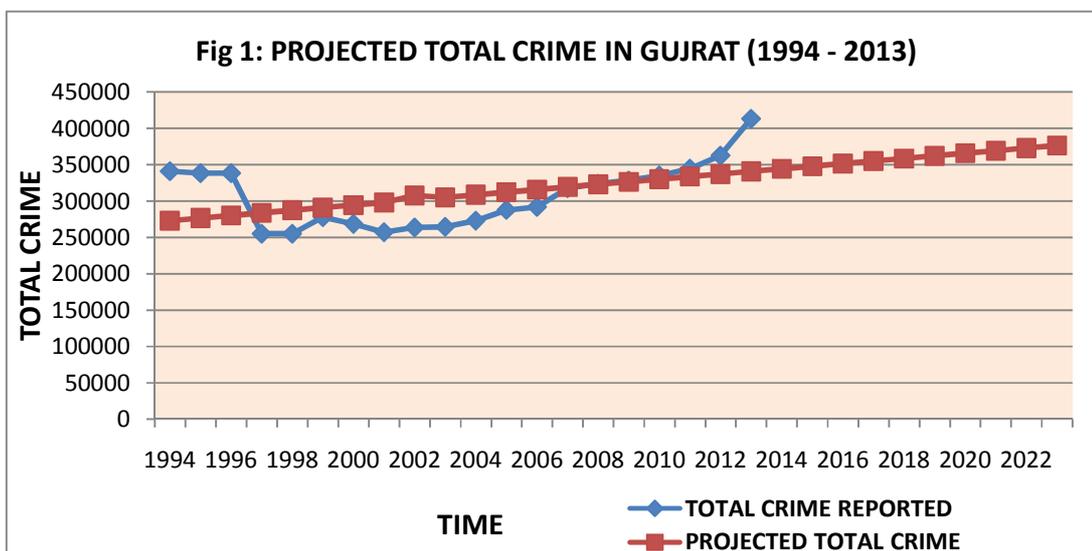
$$Y = 269578.668 + 3561.689 \ t$$
S.E.   (18240.976) (1522.727)

t-value   (14.779)   (2.339)

Where   Y = Total Crime R^2 = 0.233

t = Time   F = 5.471

S.E. = Standard Error   D-W = 1.91

Fig 1: PROJECTED TOTAL CRIME IN GUJRAT (1994 - 2013)

Based on linear trend, average increase in total crime per year was 3561.69 and found to be significant at 5% level of significance. Increase in population, existence of large illiterate population, rise in migration and trends towards urbanization etc are bound to increase the total crime in Gujrat state in future. There will be coexistence of conventional as well as modern economic and white-collar crimes. Cyber crime is most prominent emerging crime. With the accentuations of social tensions and fissiparous tendencies, there has been a tremendous growth in the commitments of police qualitatively and quantitatively. To deal with this situation, a more professional, specialized and intelligent police force would be required. Total police expenditure in Gujrat comprises of expenditure incurred under twenty-three heads.

1. Salaries
2. Wages
3. Reward
4. Travelling Expenditure
5. Office Expenditure
6. Rent, Rates and Taxes
7. Arms and Ammunition
8. Cost of Ration
9. Petroleum, Oil and Lubricants
10. Clothing and Tentage
11. Publicity and Advertising
12. Maintenance
13. Payment for Professional and Special Services
14. Contribution
15. Secret Service Expenditure
16. Other Charges
17. Motor Vehicles
18. Machinery and Equipment
19. Modernization
20. Liveries
21. Police Welfare Fund
22. Charged Expenditure
23. Matching Grant

Total police expenditure is the sum total of the expenditure incurred every year under the above-mentioned heads. It will not be a fruitful exercise to project every head separately as the assigning of weight-ages to different heads purely depends upon the priorities set in by bureaucratic-political policies which keep on changing from time to time according to prevailing circumstances and the funds at the disposal of State Government

Projected total police expenditure as a function of time

Total expenditure on police in Gujrat in Rs. Crore from 1994 to 2013 and projected total expenditure from 1994 to 2023 is given in table 2.

Table 2: Projected Total Police Expenditure as a function of Time (1994-2023)

Year	Actual Total Police Expenditure at constant prices (Rs. Crore)	Projected Total Police Expenditure at constant prices (Rs. Crore)
1994	685.63	632.51
1995	585.62	655.91
1996	585.62	679.31
1997	749.32	702.70
1998	749.32	726.10
1999	917.16	749.49
2000	881.13	772.89
2001	822.65	796.29
2002	889.43	819.68
2003	834.81	843.08
2004	797.93	866.47
2005	777.22	889.87
2006	786.64	913.27
2007	783.78	936.66
2008	812.19	960.06
2009	922.61	983.45
2010	835.96	1006.85
2011	1280.39	1030.25
2012	1368.84	1053.64
2013	1029.16	1077.04
2014	---	1100.43
2015	---	1123.83
2016	---	1174.23
2017	---	1170.62
2018	---	1194.02
2019	---	1217.41
2020	---	1240.81
2021	---	1264.21
2022	---	1287.60
2023	---	1311.00

Source: Crime in India, National Crime Record Bureau, Ministry of Home. (Various issues 1994 - 2013)

Note: Figures for the years 1996 & 1998 were not available, which are filled by figures of the preceding years.

$$Y = 609.117 + 23.396\ t$$
$$\text{S.E.} = (63.889)\ (5.333)$$
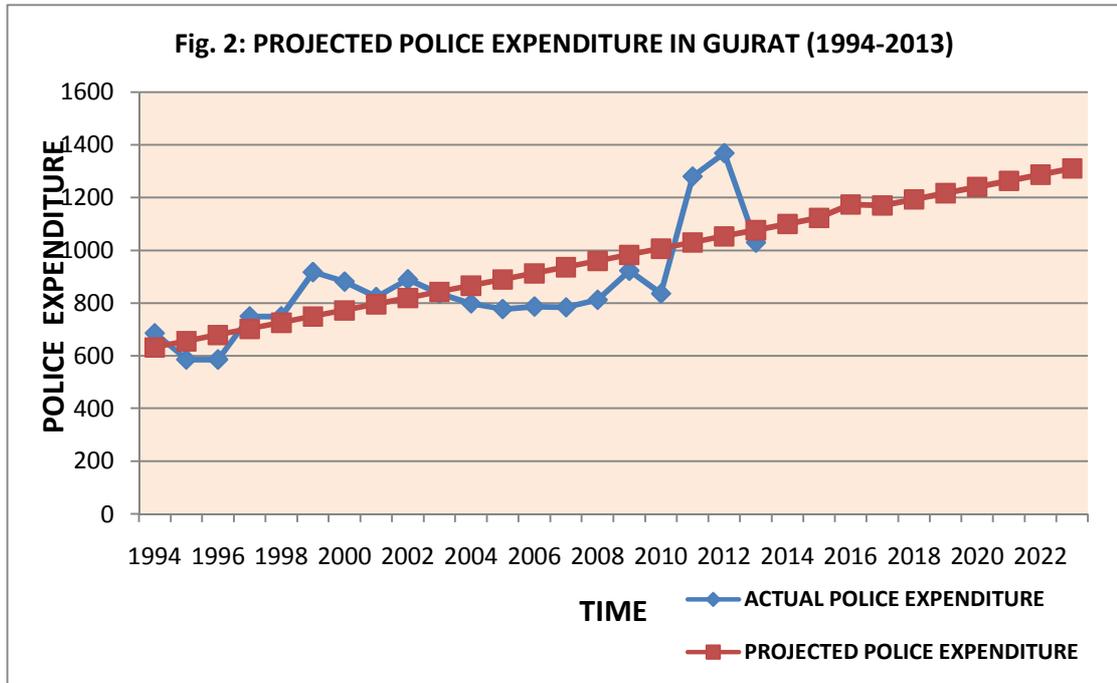$$t - \text{value}\ (9.534)\ (4.387)$$

where

$R^2 = 0.517$ Y = Total Police Expenditure

F = 19.242   t = Time

D-W = 1.81   S.E. = Standard Error

Fig. 2: PROJECTED POLICE EXPENDITURE IN GUJRAT (1994-2013)

The average increase in total expenditure at constant prices was found to be Rs. 23.40 crore per year, which was found to be significant at 5% level of significance. Police in future shall have to acquire specialized knowledge and skills and become pro-active rather than reactive to handle sophisticated criminals using high-tech equipment. Police will have to acquire more professional specialization and expertise at all levels. This will call for a dramatic change in the functioning of police itself. All this will enhance police expenditure in times to come. Expenditure on police will have to be tested against the touchtone of 'value of money'. Police training will have to change; both by bringing about attitudinal change as well as for constantly updating their knowledge and skills.

Projected total police expenditure and projected total crime in Gujrat state.

On the basis of projected total crime from 1994 to 2023, projected total expenditure on police was established and given in table 3.

Table 3: Projected Total Police Expenditure and Projected Total Crime (1994-2023)

Year	*Projected Total Crime	**Projected Total Police Expenditure (at constant prices) (Rs. Lakh)
1994	341068	68563
1995	338459	58562
1996	338459	58562
1997	255167	74932
1998	255167	74932
1999	277847	91716
2000	268735	88113
2001	257297	82265
2002	263702	88943
2003	264458	83481
2004	273113	79793
2005	287750	77722
2006	292057	78664
2007	317946	78378
2008	324123	81219
2009	328522	92261
2010	335190	83596
2011	344583	128039
2012	362649	136884
2013	413236	102916
2014	344374	110043
2015	347935	112383
2016	351498	117423
2017	355059	117062
2018	358621	119402
2019	362183	121741
2020	365744	124081
2021	369306	126421
2022	372868	128760
2023	376429	131100

Note: *The total crime for 1994 to 2013 is actual total crime taken from Crime in India, National Crime Record Bureau, Ministry of Home Affairs. (Various issues 1994 - 2013) and from 2014 to 2023 are projected total crime respectably (reference table 1)

** The total police expenditure from 1994 to 2013 is actual total police expenditure taken from Crime in India, National Crime Record Bureau, Ministry of Home Affairs. (Various issues 1994 - 2013) and from 2014 to 2023 are projected total police expenditure in Gujrat (reference table 2)

$$Y = -10062.621 + 0.33 \ x$$
$$S.E. = (25663.424) \quad (0.078)$$
$$t\text{-value} \ (-0.392) \quad\quad (4.219)$$

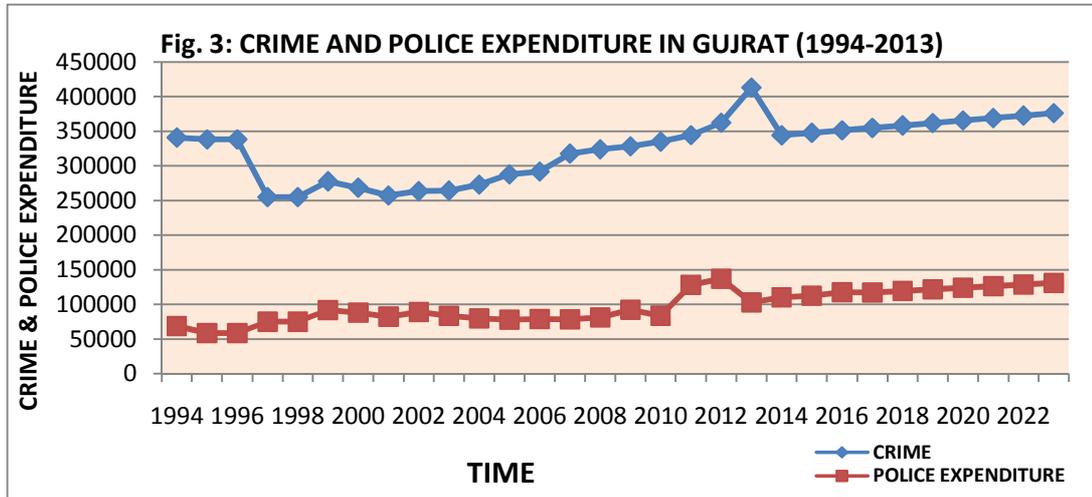Where Y = Total Police Expenditure   x – Projected Total Crime

R =   0.823 R^2 = 0.389   F =   17.801   D-W = 1.801

S.E. = Standard Error

Fig. 3: CRIME AND POLICE EXPENDITURE IN GUJRAT (1994-2013)

It can be seen that total police expenditure is dependent on total crime in the state and moreover both these variables indicate high degree of correlation to the extent of 0.82. Crime has emerged as the most monstrous agent of economic dis-organization. It is the main obstacle in the way of the economic development due to its significant and negative impact on investment growth and the market system. Anti-development crimes have resulted in capital flight from the states. Combating crime needs strengthening of police force quantitatively and qualitatively. Moreover, the state government has the whole responsibility to maintain peace and hence it has to incure additional police expenditure whenever there is increase in total crime.

SUGGESTIONS AND POLICY IMPLICATIONS

1) Future research unit must be established at Gujrat Police headquarters. Future research is a discipline devoted to addressing potential changes in our society. The future is not predetermined or predictable and can be influenced by individual and organizational choices. Through the use of environmental scanning and analytical examining the right data with appropriate forecasting methods, the future research unit produces forecasts and policy options that allow police department to improve the odds of preferable future from among the many existing alternatives.

2) It was projected that average annual increase in total crime per year will be 3561.69. There will be coexistence of conventional as well as modern economic and white collar crimes. Cyber crime is most prominent emerging crime. With the accentuations of social tensions and fissiparous tendencies, there has been a tremendous growth in the commitments of police quantitatively and quantitatively. To deal with this situation, a more professional, specialized and intelligent police force would be required.

3) It can be seen that total police expenditure is highly dependent on total crime in the state. Anti-development crimes have resulted in capital flight from the states. The State Governments has the responsibility to maintain peace and hence it has to incur additional police expenditure whenever there is increase in total crime.

4) Emphasis must be given on special education (as in other professions) according to job needs and professional demands. There is no separate University for police services as yet. Such Universities are the need of the day for conducting various academic courses, which should be made compulsory as basic eligibility condition for recruitment of police personnel at different levels. It is high time that routine recruitment methods be abandoned, replacing the same with well-designed tests and evaluation systems testing and judging the potentiality of a professional policeman. The recruitment should be sort of 'selective breeding' conforming to professional recruitments with scientific methods. The professional characteristics in the police personnel will make them proper catalysts to improve upon the existing police-community relations and better efficiency parameters. Objective tests for professional suitability in each rank will help, judge and evaluate the overall suitability of candidates for real professionals.

5) Modernization of police equipments is highly essential for police professionalism. The effectiveness of the police depends much upon the latest types of equipments. The introduction of computers to the world of police functioning and scientific advancements and research outcomes in the world of Criminology and Forensic sciences can translate the concept of police professionalization into a reality in modern times. Scientific equipment, automation and the overall use of science and technology in the various areas of police performance will go a long way towards providing police with the status of a professional.

CONCLUSION

It is clear from the above discussion that the increase in police force was essential as there was growth in population, urbanization, industrialization and above all to counter crime in recent past in the state of Gujrat. Moreover it should be kept in mind that the police department has a distinct nature where magnitude of human resources (constabulary in particular) forms an integral part of basic infrastructure. The presence of a large police force no doubt acts as a deterrent to sponsored crime, and assists in the existence of business friendly peaceful environment congenial for self sustained, self generating economic development. It was projected that average increase in total crime per year in Gujrat will be 3561.69. There will be coexistence of conventional as well as modern economic and white-collar crimes.

The discipline of Police Administration in higher education must be revised and updated in order to meet the challenges of policing in the present scenario. Serious research has to be made by intellectuals from various disciplines so that appropriate suggestions need to be incorporated for education and training of police personnel. Procedural protocols for various aspects need to be followed. The introduction of computers to the world of police functioning and scientific

advancements and research outcomes in the world of Criminology and Forensic Sciences can translate the concept of police professionalization into a reality in modern times. Education and investigation of Economic crimes and Cyber crimes must be prioritized and made part of the training course.

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