



50th ALL INDIA POLICE SCIENCE CONGRESS 2024

19-20 November 2024
Rashtriya Raksha University, Gandhinagar, Gujarat



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POLICING

IN TRANSFORMING INDIA



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Smt. Droupadi Murmu
President of India



राष्ट्रपति
भारत गणतंत्र
PRESIDENT
REPUBLIC OF INDIA

संदेश

यह हर्ष का विषय है कि पुलिस अनुसंधान एवं विकास ब्यूरो, राष्ट्रीय रक्षा विश्वविद्यालय के सहयोग से 19 से 20 नवंबर, 2024 को गांधीनगर में अखिल भारतीय पुलिस विज्ञान कांग्रेस का स्वर्ण जयंती समारोह आयोजित कर रहा है और इस अवसर पर सम्मेलन की कार्यवाही का एक "सार-संग्रह" का प्रकाशन भी कर रहा है।

हमारे पुलिस बलों ने अपराध नियंत्रण, आंतरिक सुरक्षा और नक्सल विरोधी अभियानों के द्वारा देश और देशवासियों की सुरक्षा को सुनिश्चित किया है। उन्होंने विषम परिस्थितियों में देश की सीमाओं की सुरक्षा के साथ-साथ प्राकृतिक आपदाओं के समय बचाव संबंधी कार्य भी किए हैं।

मैं आशा करती हूँ कि इस समारोह में नवीनतम तकनीक और कृत्रिम बुद्धिमत्ता के उपयोग से साइबर अपराध पर रोकथाम और पुलिस की कार्यप्रणाली को और बेहतर बनाए जाने पर सार्थक विमर्श होगा। साथ ही, इससे पुलिस बलों में कर्तव्य-परायणता, साहस और वीरता की भावना सुदृढ़ होगी तथा वे अधिक जोश एवं उत्साह से अपने दायित्वों का निर्वहन करेंगे।

मैं, इस समारोह से जुड़े पुलिस अनुसंधान एवं विकास ब्यूरो के सभी अधिकारियों और कार्मिकों को बधाई देती हूँ तथा इसके सफल आयोजन की कामना करती हूँ।

द्रौपदी
(द्रौपदी मुर्मू)

नई दिल्ली
17 नवम्बर, 2024



Shri Jagdeep Dhankhar
Vice President of India



सत्यमेव जयते

उपराष्ट्रपति

भारत गणराज्य

VICE-PRESIDENT
REPUBLIC OF INDIA

संदेश

भारतीय पुलिस के सामयिक हित के विषयों पर विचार विमर्श करने के लिए पुलिस अनुसंधान एवं विकास ब्यूरो और राष्ट्रीय रक्षा विश्वविद्यालय (आर आर यू), गांधीनगर के सम्मिलित सहयोग से अखिल भारतीय पुलिस विज्ञान कांग्रेस की स्वर्ण जयंती (50 वें संस्करण) का आयोजन सराहनीय है।

समाज में सामाजिक समरसता और सौहार्द के लिए एक मजबूत एवं प्रभावी कानून व्यवस्था का होना अत्यंत आवश्यक है। इसके लिए सभी संस्थाओं और हितधारकों के बीच मंथन और चिंतन जरूरी है। अत्यंत हर्ष का विषय है की यह राष्ट्रीय आयोजन फॉरेंसिक विशेषज्ञों, सामाजिक वैज्ञानिकों और अन्य हितधारकों को न केवल एक साझा मंच प्रदान करेगा बल्कि वर्तमान में अपनाई जा रही सर्वोत्तम प्रथाओं को एक दूसरे के साथ विमर्श करने का अवसर भी प्रदान करेगा।

मैं 50वीं अखिल भारतीय पुलिस विज्ञान सम्मेलन के आयोजकों और प्रतिभागियों को हार्दिक बधाई देता हूँ एवं इस सम्मेलन की सफलता की मंगल कामना करता हूँ।

धन्यवाद।

जगदीप धनखड़

नई दिल्ली

13 नवंबर, 2024



Shri Narendra Modi
Prime Minister of India



सत्यमेव जयते

प्रधान मंत्री
Prime Minister

संदेश

अखिल भारतीय पुलिस विज्ञान कांग्रेस के स्वर्ण जयंती सम्मेलन की हार्दिक बधाई एवं शुभकामनाएं। गांधीनगर, गुजरात में पुलिस अनुसंधान एवं विकास ब्यूरो और राष्ट्रीय रक्षा विश्वविद्यालय द्वारा सम्मिलित रूप से इस कार्यक्रम के आयोजन के बारे में जानकारी प्रसन्नता हुई है। इस अवसर पर विषय आधारित सार-संग्रह का प्रकाशन सराहनीय है।

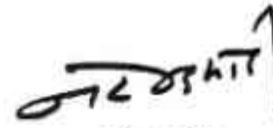
बदलते समय में अपराध के स्वरूप और तरीकों में बदलाव आने से पुलिस बलों के सामने चुनौतियां बढ़ी हैं। अपराध पर नियंत्रण के साथ समाज में शांति-व्यवस्था स्थापित करने में महत्वपूर्ण भूमिका निभाने वाले पुलिस बल के हमारे साथियों के लिए अत्यंत आवश्यक है कि वे वैज्ञानिक एवं आधुनिक तकनीकों से अवगत हों।

बीते वर्षों से निरंतर पुलिस विज्ञान कांग्रेस पुलिसिंग में आधुनिकतम तकनीकों, नए विचारों और नवाचारों के आदान-प्रदान का एक उपयोगी मंच रहा है। इस सम्मेलन के जरिए पुलिस बल, शिक्षाविद, फॉरेंसिक विशेषज्ञ और नागरिक संगठन विभिन्न विषयों से जुड़ी आवश्यक जानकारीयों एक दूसरे से साझा करते रहे हैं।

इस बार के सम्मेलन में नए आपराधिक कानून, फॉरेंसिक और अपराध जांच में एआई का प्रयोग, साइबर धोखाधड़ी, पुलिसिंग में ब्लॉकचेन तकनीक जैसे विषयों पर चर्चा, हमारे पुलिस बलों को भविष्य की चुनौतियों के लिए तैयार करेगी। सम्मेलन में विभिन्न विषयों पर गहन विचार-विमर्श से एक व्यावहारिक रोडमैप तैयार होगा, जिससे पुलिस बलों को न केवल वर्तमान चुनौतियों से निपटने के लिए बल्कि, भविष्य में सामने आने वाली समस्याओं के समाधान के लिए भी मार्गदर्शन प्राप्त होगा।

अमृत काल में एक भव्य और विकसित भारत के निर्माण की दिशा में देश तेजी से अग्रसर है। एक सुरक्षित और संरक्षित समाज से राष्ट्र की प्रगति को गति मिलती है और मुझे विश्वास है कि इसे सुनिश्चित करने की दिशा में यह सम्मेलन कारगर सिद्ध होगा। हमारे पुलिस बलों के निरंतर प्रयास और देशवासियों के सामूहिक योगदान से राष्ट्र निश्चित ही विकास की नई ऊंचाइयों को छुएगा।

अखिल भारतीय पुलिस विज्ञान कांग्रेस का 50वां सम्मेलन अपने उद्देश्यों की पूर्ति में सफल हो, इस विश्वास के साथ सम्मेलन में भाग ले रहे सभी प्रतिभागियों और आयोजकों को एक बार फिर से हार्दिक शुभकामनाएं।


(नरेन्द्र मोदी)

नई दिल्ली
कार्तिक 25, शक संवत् 1946
16 नवम्बर, 2024

अमित शाह



संदेश

गृह मंत्री एवं सहकारिता मंत्री
भारत सरकार

पुलिस अनुसंधान एवं विकास ब्यूरो द्वारा दिनांक 19 और 20 नवम्बर, 2024 तक गाँधीनगर, गुजरात में राष्ट्रीय रक्षा विश्वविद्यालय के सहयोग से अखिल भारतीय पुलिस विज्ञान सम्मेलन के 50वें संस्करण का आयोजन हार्दिक प्रसन्नता का विषय है।

अखिल भारतीय पुलिस विज्ञान सम्मेलन केंद्रीय सशस्त्र पुलिस बलों, राज्य पुलिस कर्मियों, फॉरेंसिक विशेषज्ञों, सुधार सेवाओं, शिक्षाविदों तथा विभिन्न हितधारकों के विचारों एवं नीति अनिवार्यताओं, सर्वोत्तम प्रथाओं के आदान-प्रदान हेतु आदर्श मंच प्रदान करता है। कानून प्रवर्तन एजेंसियों की क्षमता निर्माण करने की दिशा में पुलिस अनुसंधान एवं विकास ब्यूरो की यह पहल सराहनीय है।

मुझे विश्वास है कि इस आयोजन के लिए विचार-विमर्श और चर्चा के लिए चुने गए सभी विषय समकालीन समाज में पुलिसिंग की चुनौतियों से निपटने के लिए नवीन रणनीतियों को तैयार करने और आंतरिक सुरक्षा सुनिश्चित करने में मदद करेगा।

माननीय प्रधानमंत्री श्री नरेन्द्र मोदी जी के नेतृत्व में पुलिस और फॉरेंसिक तंत्र को मजबूत करना एक महत्वपूर्ण कदम है, जिससे न केवल अपराधों की जाँच में तेजी आती है, बल्कि अपराधों के समाधान में भी पारदर्शिता और विश्वसनीयता सुनिश्चित हुई है। नेशनल फॉरेंसिक साइंस यूनिवर्सिटी की स्थापना और भारतीय न्याय संहिता के माध्यम से फॉरेंसिक को जाँच प्रक्रिया का अनिवार्य हिस्सा बनाना एक ऐतिहासिक कदम है। इस तरह के फैसलों से अपराधों के समाधान में वैज्ञानिक और तकनीकी पद्धतियों का इस्तेमाल बढ़ेगा, जिससे न्याय की प्रक्रिया और सटीकता में सुधार होगा।

मैं, अखिल भारतीय पुलिस विज्ञान सम्मेलन में भाग लेने वाले सभी पदाधिकारियों को अपनी शुभकामनाएँ प्रेषित करते हुए सम्मेलन के सफल आयोजन की कामना करता हूँ।

(अमित शाह)

श्री राजीव कुमार शर्मा, भा.पु.से.,
महानिदेशक, पुलिस अनुसंधान एवं विकास ब्यूरो

नित्यानन्द राय
NITYANAND RAI



गृह राज्य मंत्री
भारत सरकार
नार्थ ब्लॉक, नई दिल्ली - 110001
MINISTER OF STATE FOR
HOME AFFAIRS
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NORTH BLOCK, NEW DELHI - 110001

संदेश

मुझे यह जानकारी अत्यन्त प्रसन्नता हो रही है कि पुलिस अनुसंधान एवं विकास ब्यूरो, गृह मंत्रालय एवं राष्ट्रीय रक्षा विश्वविद्यालय, गांधीनगर, गुजरात के सहयोग से 19-20 नवम्बर, 2024 को गांधीनगर, गुजरात में 50वीं अखिल भारतीय पुलिस विज्ञान सम्मेलन का आयोजन किया जा रहा है।

मैं, पुलिस अनुसंधान एवं विकास ब्यूरो को विगत 50 वर्षों की पुलिस के मार्गदर्शन करने के इस उल्लेखनीय प्रयास की सहृदय प्रशंसा करता हूँ। किसी भी देश की आर्थिक वृद्धि और विकास के लिए कुशल कानून व्यवस्था अत्यन्त अनिवार्य होती है। मुझे आशा है कि देश की सभी कानून प्रवर्तन एजेंसियों को इस सम्मेलन से अग्रिम चुनौतियों का सामना करने के लिए एक सुदृढ़ और सुसंगठित रणनीति तैयार करने में मदद मिलेगी।

मैं, इस अवसर पर पुलिस अनुसंधान एवं विकास ब्यूरो, राष्ट्रीय रक्षा विश्वविद्यालय, गांधीनगर, गुजरात और उनके सक्षम अधिकारियों एवं कर्मियों की टीम को इस पुलिस विज्ञान सम्मेलन के सफल आयोजन के लिए शुभकामनाएं देता हूँ।

(नित्यानन्द राय)

नई दिल्ली।
13 नवम्बर, 2024

बंडी संजय कुमार
BANDI SANJAY KUMAR



गृह राज्य मंत्री
भारत सरकार
**MINISTER OF STATE FOR
HOME AFFAIRS
GOVERNMENT OF INDIA**



संदेश

मुझे यह जानकारी अत्यंत प्रसन्नता हो रही है कि पुलिस अनुसंधान और विकास ब्यूरो, गृह मंत्रालय, भारत सरकार द्वारा राष्ट्रीय रक्षा विश्वविद्यालय, गांधीनगर गुजरात के सहयोग से दिनांक 19 व 20 नवम्बर, 2024 को 50वें अखिल भारतीय पुलिस विज्ञान सम्मेलन-2024 का आयोजन किया जा रहा है।

इस राष्ट्रीय सम्मेलन में देश के विभिन्न राज्यों के पुलिस बलों, सीएपीएफ, सीपीओ, फॉरेंसिक विज्ञान संगठनों के प्रतिनिधियों और अकादमिक एवं नागरिक समाज संगठनों के विशेषज्ञ भाग लेंगे।

मुझे आशा है कि पुलिस साइंस सम्मेलन में पुलिसिंग से जुड़ी वर्तमान और भविष्य की चुनौतियों पर गहन मंथन होगा तथा सफल प्रयोगों एवं प्रयोगसिद्ध अनुसंधानों को अंगीकृत करने की दिशा में भी सकारात्मक निर्णय लिया जाएगा।

अखिल भारतीय पुलिस विज्ञान सम्मेलन-2024 के सफल आयोजन हेतु मेरी हार्दिक शुभकामनाएं।


(बंडी संजय कुमार)

दिनांक : 14.11.2024
नई दिल्ली।

गोविंद मोहन, भा.प्र.से.
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संदेश

मुझे यह जानकारी अत्यंत प्रसन्नता हो रही है कि पुलिस अनुसंधान एवं विकास ब्यूरो, गृह मंत्रालय, द्वारा राष्ट्रीय रक्षा विश्वविद्यालय, गांधीनगर, गुजरात के सहयोग से 19-20 नवंबर, 2024 को गांधीनगर, गुजरात में 50वीं अखिल भारतीय पुलिस विज्ञान कांग्रेस का स्वर्ण जयंती सम्मेलन आयोजित किया जा रहा है।

2. कानून प्रवर्तन एजेंसियों को प्रौद्योगिकी के बदलते परिदृश्य के कारण गंभीर चुनौतियों का सामना करना पड़ रहा है। अखिल भारतीय पुलिस विज्ञान कांग्रेस की स्वर्ण जयंती द्वारा इन्हीं चुनौतियों का समाधान करने का प्रयास किया गया है। मुझे आशा है कि इस प्रतिष्ठित राष्ट्रीय कार्यक्रम द्वारा पुलिस अधिकारियों, सामाजिक वैज्ञानिकों, फॉरेंसिक विशेषज्ञों, एवं अन्य हितधारकों को भारतीय पुलिस के समक्ष इन चुनौतियों के ऊपर विचार-विमर्श करने के लिए एक साझा मंच मिलेगा।

3. मुझे बताया गया है कि इस अवसर पर एक संग्रह भी जारी किया जा रहा है जिसमें आपराधिक कानूनों की तैयारी, फॉरेंसिक और अपराधों की जांच, साइबर धोखाधड़ी, पुलिसिंग में ब्लॉकचेन तकनीक का भविष्य, स्मार्ट शहरों में प्रगति और चुनौतियां, जेलों में कट्टरपंथ से निपटना, समुदाय जनजातीय क्षेत्रों में पुलिस व्यवस्था और सरकारी कर्मचारियों द्वारा सोशल मीडिया के उपयोग में अनुशासन सुनिश्चित करने के लिए तंत्र आदि सामयिक विषयों पर पुलिस एवं अन्य विभिन्न विशेषज्ञों द्वारा लिखे गए लेख शामिल हैं।

4. मैं आयोजकों एवं सभी प्रतिभागियों को इस सम्मेलन के लिए शुभकामनाएं देता हूँ।


(गोविंद मोहन)

स्थान : नई दिल्ली
दिनांक : 13.11.2024

राजीव कुमार शर्मा, भा.पु.से.
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संदेश

पुलिस अनुसंधान एवं विकास ब्यूरो, गृह मंत्रालय द्वारा राष्ट्रीय रक्षा विश्वविद्यालय, गांधीनगर, गुजरात के सहयोग से 50वीं 'अखिल भारतीय पुलिस विज्ञान सम्मेलन' का यह आयोजन किया जा रहा है।

इस कार्यक्रम की 50 वर्षों की लंबी यात्रा में राज्य पुलिस बलों, केन्द्रीय सशस्त्र पुलिस बलों, जेल और सुधार गृहों के अधिकारियों के साथ-साथ अन्य विशेषज्ञों, शिक्षाविदों और नागरिक समाज की भागीदारी इस सम्मेलन को हमेशा से ही एक विशिष्ट स्थान प्रदान करती रही है।

इस वर्ष राष्ट्रीय रक्षा विश्वविद्यालय, गांधीनगर में आयोजित इस पुलिस विज्ञान सम्मेलन में गहन विचार विमर्श हेतु निम्नलिखित आठ विषयों को चुना गया है -

1. नए आपराधिक कानूनों में जवाबदेही, पारदर्शिता एवं न्याय के लिए फॉरेंसिक एवं तकनीकी का उपयोग
2. आपराधिक न्याय प्रणाली में गुणात्मकता हेतु एआई का उपयोग
3. आपदा जोखिम में कमी हेतु प्रथम प्रतिक्रिया के रूप में पुलिस की भूमिका
4. पुलिसिंग में ब्लॉकचेन प्रौद्योगिकी का भविष्य
5. साइबर धोखाधड़ी में संपत्ति का पता लगाने में चुनौतियाँ और समाधान
6. स्मार्ट सिटी में पुलिसिंग - प्रगति और चुनौतियाँ
7. जनजातीय व सीमांत क्षेत्रों में सामुदायिक पुलिसिंग
8. जेलों में कट्टरवाद से निपटने हेतु रणनीति

इस आयोजन में विचार विमर्श हेतु चयनित सभी विषयों को राज्यों/केंद्रशासित प्रदेशों के पुलिस प्रमुखों और CPOs के प्रमुखों के परामर्श से निरन्तर उभरती हुई चुनौतियों से निपटने के लिए एवं पुलिस विभाग को सक्षम बनाने के दृष्टिकोण के अनुरूप चुना गया है। इस आयोजन में प्रस्तुत किए जाने वाले सभी सम्मेलन पत्रों के चयन के लिए एक कठोर प्रक्रिया का पालन किया गया है जिसमें हमने राज्यों और सीपीओ के युवा अधिकारियों को शामिल करने के लिए विशेष प्रयास किए हैं। परंतु, इन प्रयासों को सफलता तब ही मिलेगी जब ज़मीनी स्तर तक सम्मेलन के संकल्पों को पहुंचाया जाये तथा बेहतर पुलिस व्यवस्था एवं अतिरिक्त सुरक्षा सुदृढ़ सुनिश्चित की जाये।

मैं, BPR&D और RRU के समस्त अधिकारियों और सभी प्रतिभागियों को इस 50वीं अखिल भारतीय पुलिस विज्ञान सम्मेलन के सफलतापूर्वक आयोजन हेतु किए गए प्रयासों के लिए बधाई प्रेषित करता हूँ।


(राजीव कुमार शर्मा)

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संदेश

मुझे अत्यंत हर्ष है कि इस वर्ष पुलिस अनुसंधान और विकास ब्यूरो, गृह मंत्रालय द्वारा राष्ट्रीय रक्षा विश्वविद्यालय, गांधीनगर, गुजरात के सहयोग से 50वीं अखिल भारतीय पुलिस विज्ञान सम्मेलन का आयोजन किया जा रहा है।

अखिल भारतीय पुलिस विज्ञान कांग्रेस के अवसर पर बीपीआर एंड डी पुलिस विज्ञान के क्षेत्र में विभिन्न शोध लेखों को संकलित करता है और वर्तमान चुनौतियों और संभावित समाधानों के बारे में चर्चा करने के लिए उन्हें एआईपीएससी के मंच पर लाता है।

इस सम्मेलन में पुलिसिंग से संबंधित उन निर्देशों पर जोर दिया जा रहा है जो माननीय प्रधान मंत्री और माननीय केंद्रीय गृह मंत्री द्वारा विभिन्न मंचों पर दिए गए हैं।

यह सम्मेलन पुलिसिंग के क्षेत्र में नए मुद्दों, समस्याओं, नवाचारों और प्रौद्योगिकी को समझने के साथ-साथ समाधान प्रदान करने का मार्ग प्रशस्त करता है। यह सभी राज्य पुलिस बलों, सीएपीएफएस, सीपीओ, जेल और सुधार सेवाओं, फॉरेंसिक विज्ञान संगठनों, शिक्षा जगत के विशेषज्ञों और नागरिक समाज संगठनों के प्रतिनिधियों को एक साथ लाकर पुलिस/जेल अधिकारियों के परिप्रेक्ष्य और क्षमता निर्माण क्षमताओं को व्यापक बनाता है।

मैं, अखिल भारतीय पुलिस विज्ञान सम्मेलन के सभी अधिकारियों और प्रतिभागियों को हार्दिक बधाई देता हूँ एवं इस सम्मेलन की सफलता की कामना करता हूँ।


(रवि जोसेफ लोकू)

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संदेश

अखिल भारतीय पुलिस विज्ञान सम्मेलन देश की समस्त पुलिसिंग संबंधित कार्य प्रणालियों के विचार विमर्श के लिए एक अनूठा मंच है जिसमें पुलिस सम्बन्धी समस्त पहलुओं पर सुविचारकों को विमर्श का माध्यम और आयाम प्रदान किया जाता रहा है।

यह अखिल भारतीय पुलिस विज्ञान सम्मेलन एक परंपरा हैं जिसे विगत कई वर्षों से नये-नये समसामयिक एवं प्रासंगिक विचारों द्वारा सींचा जाता रहा हैं। इसी शृंखला को आगे बढ़ाते हुए, पुलिस कार्य क्षेत्र से जुड़े विज्ञान एवं अनुसंधान में नवाचार, सार्थक प्रयोग हेतु सम्मेलन में इस बार चयनित आठ विषयों पर, देश के विभिन्न क्षेत्रों से विशेषज्ञों द्वारा सौ से ज्यादा सम्मेलन पत्र प्राप्त हुए हैं। यह प्रस्तुत पत्रों का संकलन विचारों की कड़ी को पूर्ण करता है। इस संस्करण में सभी ज्ञानवर्धक लेखों को संग्रहित किया गया है।

आशा करती हूँ की इस पचासवें संस्करण में चयनित विषयों पर गहन चर्चा, पुलिसिंग के लिए नए दृष्टिकोण और संकल्प विकसित किए जायेंगे जो आने वाले कई वर्षों तक राष्ट्र की पुलिसिंग के लिए प्रगति कारक सिद्ध होते रहेंगे।

मैं, सम्मेलन में सम्मिलित सभी वक्ताओं एवं प्रतिभागियों का हार्दिक अभिनंदन करती हूँ और अखिल भारतीय पुलिस विज्ञान सम्मेलन की सफलता की मंगल कामना करती हूँ।

रेखा लोहानी

(रेखा लोहानी)



RASHTRIYA RAKSHA UNIVERSITY

An Institution of National Importance
Pioneering National Security and Police University of India

PROF. (DR.) BIMAL N. PATEL

Vice-Chancellor, Rashtriya Raksha University
Member, National Security Advisory Board
Member, United Nations International Law Commission



With immense pride, I welcome you all to the 50th All India Police Science Congress, hosted by Rashtriya Raksha University (Institute of National Importance). I am grateful to the BPR&D for bestowing RRU with the opportunity to host the AIPSC, especially as this marks the first time an academic institution has been entrusted with this honour. This year marks the 50th edition (Golden Jubilee) of the AIPSC, a significant milestone in the history of Indian policing and academic excellence.

As per Hon'ble PM Shri Narendra Modi's vision, India is transitioning from policing in Amrit Kaal to Kartavya Kaal. This reflects a shift from securing the nation to serving its people with responsibility, transparency and justice. This era calls for a proactive, community-driven and technologically advanced police force committed to ethical practices, human rights and national security. The focus is on building a more inclusive, accountable and future-ready policing system aligned with India's growth and global leadership aspirations.

As a premier institution dedicated to national security and policing, RRU has always strived to bridge the gap between academia and the practical challenges faced by law enforcement agencies both nationally as well as globally. This congress provides an unparalleled platform for police fraternity researchers, academicians and practitioners to converge, share insights and collaborate on innovative solutions to contemporary and futuristic policing challenges and avenues.

Rashtriya Raksha University offers specialized education, conducts cutting-edge research, collaborates with police and law enforcement agencies and contributes to social welfare by means of extension activities. RRU is committed to fostering a vibrant intellectual environment that encourages critical thinking, interdisciplinary research and knowledge exchange among stakeholders.

The eight themes earmarked for the Congress are not just topics of discussion but represent the very fabric of contemporary societal challenges and the need for a cohesive and strategic response. This congress will showcase the latest advancements in police science, criminology, forensic science, cybersecurity, disaster risk reduction and other related fields. Through a series of keynote addresses, plenary sessions, panel discussions and paper presentations, the aim of the congress is to stimulate thought-provoking discussions and inspire groundbreaking research and thus ensuring an empowered National Security Architecture.

We extend our heartfelt gratitude to all the esteemed participants, keynote speakers, session chairs and organizers who have contributed to the success of this event. Your presence and contributions enrich the intellectual discourse and elevate the prestige of this congress.

I wish you a fruitful and enriching experience at the 50th All India Police Science Congress.

Professor (Dr.) Bimal N. Patel

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An Institution of National Importance

Pioneering National Security and Police University of India

Prof.(Dr.) Kalpesh. H. Wandra

Pro-Vice-Chancellor, Rashtriya Raksha University



I am honoured to extend my warmest greetings to all of you at the 50th All India Police Science Congress, a remarkable initiative that embodies the collaborative spirit and commitment to enhancing the landscape of policing and public safety in our nation. This platform, dedicated to thoughtful discussions and innovative approaches to pressing law enforcement issues, comes at a time when we increasingly seek responses to complex challenges.

The AIPSC will be attended by delegates from all State Police Forces, CAPFs, CPOs, Prison & Correctional Services, Administrators, Academic Institutions and Technology Experts. This will transform Rashtriya Raksha University into a living arena of knowledge on Police & National Security.

At Rashtriya Raksha University, we are committed to shaping a police force that is equipped with the latest technology, rooted in community engagement and dedicated to safeguarding human rights while ensuring national security. Together, we will build a future-ready policing system that embodies the spirit of responsibility, innovation and public service.

I am confident that the deliberations at this congress will lead to innovative solutions and practical recommendations. Let us use this platform to foster collaboration, share knowledge and inspire action.

As we embark on these enlightening discussions, I urge all participants to engage with open minds and a spirit of collaboration. The outcomes of this Congress will not only contribute to our collective knowledge but also provide actionable insights for effective policymaking and practice in law enforcement.

Let us work together to strengthen the frameworks that govern our society, ensuring a safer, more equitable future for all citizens.

Prof.(Dr.) Kalpesh. H. Wandra



RASHTRIYA RAKSHA UNIVERSITY

An Institution of National Importance

Pioneering National Security and Police University of India

Maj Gen Deepak Mehra, Kirti Chakra, AVSM, VSM (Retd.)
Director, School of Internal Security and SMART Policing (SISSP)



It is both an honour and a privilege to be the hosts along with Bureau of Police Research and Development of the 50th All India Police Science Congress at the Rashtriya Raksha University, Gandhinagar, Gujarat. This platform stands as a testament to the collective commitment of scholars, professionals, practitioners and industry in shaping the future of policing, law enforcement and disaster resilience in our country.

In today's rapidly changing world, the challenges faced by law enforcement agencies are multifaceted which need to be addressed with a dynamic and adaptive approach. Our focus is not only on the traditional dimensions of policing but integrating pioneering methodologies that address contemporary challenges including, public safety, emerging security risks, exponentially growing variations of crime scenes and natural disasters. A holistic approach to policing is at the core of our vision. It emphasizes the importance of community engagement, the integration of technology, data-driven decision-making and a deep understanding of the needs of our society.

Today, we are in the midst of a pivotal shift—a transition from reactive law enforcement to a more proactive, responsible and inclusive approach, that aligns with the Kartavya Kaal or "Era of Responsibility" that our nation is embracing.

In the Kartavya Kaal, the focus of policing is no longer just about enforcing laws but about empowering citizens, protecting public order and ensuring justice for all. The essence of Kartavya Kaal signifies an era in which every individual, institution, and member of society is responsible for contributing to the collective well-being, essentially to become a karmayogi. This period demands that law enforcement exemplify integrity, transparency and service. These values that are at the heart of our nation's journey towards a more secure, just and a resilient society. This holistic approach emphasizes integrating disaster risk reduction (DRR) into law enforcement strategies. Given India's vulnerability to natural hazards, police forces as early responders must not only enforce laws but actively plan for disaster preparedness, response, and recovery. Effective DRR requires police to be proactive and equipped with the necessary resources and skills. This Congress therefore aims to explore the collaboration between policing, disaster management and community preparedness to build safer communities.

As we continue to work towards a safer and more secure nation, I am confident that our collective efforts will lead to meaningful changes in the way we approach internal security as an all-encompassing entity both on the ground and at the policy level. I extend my heartfelt congratulations to all the contributors and participants for partaking and contributing to the success of this Congress.

Maj Gen Deepak Mehra

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THEME 1:

USE OF FORENSICS AND TECHNOLOGY IN NEW CRIMINAL LAWS



LEVERAGING FORENSICS AND TECHNOLOGY IN NEW CRIMINAL LAWS FOR ENHANCED ACCOUNTABILITY, TRANSPARENCY, AND JUSTICE

Shri Anupam Agrawal, IPS

ABSTRACT

India's newly introduced criminal laws – the Bharatiya Nagarik Suraksha Sanhita (BNSS), Bharatiya Nyaya Sanhita (BNS), and Bharatiya Sakshya Adhiniyam (BSA) of 2023 – aim to create a criminal justice system that is more accountable, transparent, and aligned with modern technology and forensic science. This paper details key reforms, especially those leveraging technology and forensic practices to enhance law enforcement efficiency and fairness. Provisions for video-recorded searches, electronic summons, DNA profiling, community policing, and structured evidence management are discussed alongside specific legal sections, illustrating the comprehensive approach of these reforms.

INTRODUCTION

India's criminal justice system has long required modernization, as the core statutes – the Indian Penal Code (IPC) of 1860, the Criminal Procedure Code (CrPC) of 1973, and the Indian Evidence Act of 1872 – were crafted over a century ago. The recently introduced BNSS, BNS, and BSA are landmark reforms that aim to simplify the system, strengthen accountability, and integrate advanced forensic and digital technologies. These laws mark a progressive step towards creating a justice system that is responsive to modern societal needs, enabling law enforcement to handle cases with greater efficiency and fairness.

OVERVIEW OF NEW CRIMINAL LAWS

The Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023, replaces the Criminal Procedure Code (CrPC) with a focus on simplifying legal procedures to enhance accessibility for citizens. Among its notable reforms, the BNSS introduces an online FIR system, expedited processing timelines, and updated police powers, all under new oversight mechanisms to prevent misuse. Section 173 of the BNSS facilitates an electronic FIR system, allowing citizens to file FIRs online, which must then be verified in person within three days. This streamlined process makes complaint registration more accessible and responsive to citizens' needs. Another critical change is found in Section 105, which mandates video recording of search and seizure procedures, with copies submitted to a magistrate within 48 hours, promoting transparency and safeguarding the evidence collection process from potential tampering. Similarly, the Bharatiya

Nyaya Sanhita (BNS), 2023, replaces the Indian Penal Code (IPC) and introduces a more structured and contemporary penal system that addresses issues such as organized crime, cybercrimes, and mob lynching. This new code adopts a victim-centered approach, increasing penalties for serious offences and fostering community involvement in crime prevention. Section 111 specifies penalties for crimes such as organized crime and terrorism, while Section 152 deals with electronic communications that threaten national sovereignty and unity, ensuring that the penal system addresses evolving threats. Additionally, the BNS supports community policing initiatives, enhancing accountability and building trust between law enforcement and the public, especially in underserved areas.

The Bharatiya Sakshya Adhiniyam (BSA), 2023, replaces the Indian Evidence Act and modernizes the approach to evidence handling, incorporating electronic and scientific evidence standards. Designed to meet current forensic challenges, the BSA sets rigorous standards for handling digital evidence, ensuring transparency and accuracy in legal proceedings. In particular, Section 2(d) broadens the definition of "document" to include digital records, emails, and server data, while Section 2(e) redefines "evidence" to incorporate electronic statements, thereby strengthening the validity of digital evidence. Section 63 introduces detailed procedures for collecting, storing, and presenting digital evidence, enforcing a clear chain of custody to prevent tampering and support the integrity of legal processes.

TECHNOLOGICAL INTEGRATION IN CRIMINAL JUSTICE REFORMS

Technology plays a transformative role in the new criminal laws, establishing rigorous standards for digital evidence, improving transparency, and providing accessible and efficient processes for citizens. Key technological advancements under the BNSS, BNS, and BSA include:

- The Bharatiya Nagarik Suraksha Sanhita (BNSS) introduces several digital reforms to enhance transparency and efficiency in the justice system. Section 105 mandates the video recording of all search and seizure operations, with copies sent to the magistrate within 48 hours through the e-Sakshaya App. This ensures the integrity of evidence collection and reduces misuse of power. Section 530 enables electronic trials, inquiries, and proceedings, reducing delays and allowing remote participation, improving access to the judicial process. Additionally, Section 277 allows summons and warrants to be issued electronically, speeding up communication and minimizing delays.
- Section 173 of the BNSS allows citizens to file an FIR online, with mandatory in-person verification within three days. This system improves accessibility while

ensuring transparency and safeguards against misuse. Section 193 ensures that victims and complainants receive electronic updates on case progress every 90 days, promoting trust and keeping them engaged throughout the legal process. The digitization of court records, as promoted by the BNSS, provides public access to case details, enhancing transparency and allowing citizens to track judicial decisions.

- The Bharatiya Sakshya Adhiniyam (BSA) modernizes the evidentiary framework to include digital records. Section 2(d) broadens the definition of "document" to include electronic records such as emails and server data, giving digital evidence equal weight in legal proceedings. Section 2(e) redefines "evidence" to include electronically given statements, allowing electronic depositions in court. Section 63 streamlines the admissibility of electronic records, introducing two new forms under the BNSS schedule, which ensures strict standards for their legal acceptance. Section 57 expands the definition of primary evidence to include digital files, recognizing the importance of digital data in the judicial process.
- The Bharatiya Nyaya Sanhita (BNS) introduces provisions to address modern crimes facilitated by electronic communication. Section 152 criminalizes actions that threaten India's sovereignty, unity, or integrity through electronic means. Section 196 penalizes using electronic media to incite enmity between groups, while Section 294 regulates the sale and display of obscene content in electronic form, curbing harmful online materials. Section 308 addresses extortion carried out through digital platforms, responding to the rise in financial crimes facilitated by online tools.
- Section 353 of the BNS criminalizes public mischief through electronic means, aiming to counter the disruptive effects of misinformation. Lastly, Sections 335, 336, and 337 include electronic records as admissible evidence in cheating offences, strengthening the legal framework to address online fraud and digital deception. These reforms reflect a modernization of India's legal system, integrating digital technologies to ensure transparency and respond to evolving forms of crime.

MAINSTREAMING FORENSICS IN NEW CRIMINAL LAWS

The new criminal laws place a strong emphasis on forensic science to ensure that evidence collection, storage, and analysis align with scientific standards, particularly in cases involving serious offences. Section 176 of the Bharatiya Nagarik Suraksha Sanhita (BNSS) mandates the attendance of forensic experts at crime scenes for cases carrying punishments of over seven years. The evidence collection process must be documented through videography, which ensures transparency and provides a reliable visual record of the investigation.

Section 193 of the BNSS focuses on the chain of custody for electronic evidence. For cases involving digital evidence, the law requires detailed documentation of the sequence of custody in the final report. This provision guarantees a clear and accountable chain of custody, which is vital for maintaining the integrity and credibility of evidence in court.

The Bharatiya Sakshya Adhiniyam (BSA) sets strict standards for handling all types of evidence, particularly electronic evidence, as outlined in Section 63. This accountability framework ensures that evidence is collected, stored, and presented in a tamper-proof manner. By enforcing these procedures, the law strengthens the integrity of the evidence management process and reduces the risk of corruption or procedural errors.

Sections 52 and 184 of the Bharatiya Nyaya Sanhita (BNS) make DNA profiling mandatory for serious offences such as murder and sexual assault. This scientific approach aids in the accurate identification of both victims and suspects, reducing the chances of wrongful convictions and ensuring a victim-centered approach in sensitive cases.

Lastly, Section 39 of the BSA broadens the scope for forensic experts by including individuals with specialized skills in fields such as digital forensics, behavioural science, and cyber investigations. This provision allows the legal system to leverage specialized knowledge, ensuring that evidence is analysed thoroughly and precisely, reflecting the growing importance of diverse forensic expertise in modern investigations.

NATIONAL FORENSIC INFRASTRUCTURE ENHANCEMENT SCHEME, 2024

The National Forensic Infrastructure Enhancement Scheme, 2024 has been launched to address the demands of the new criminal laws and enhance forensic capabilities across India. The primary objectives of the scheme are to address the shortage of trained forensic experts and to enhance forensic infrastructure, ensuring that the criminal justice system can effectively meet the requirements of the Bharatiya Nagarik Suraksha Sanhita (BNSS), Bharatiya Nyaya Sanhita (BNS), and Bharatiya Sakshya Adhiniyam (BSA). This initiative aims to provide a skilled workforce and ensure that high-quality forensic resources are available to all states.

The scheme has an allocated budget of ₹2,254.43 crore for the period from 2024 to 2029. This significant investment demonstrates the government's commitment to creating a robust forensic framework that meets both present and future needs, supporting the evolving demands of the criminal justice system.

Key components of the scheme include the establishment of National Forensic Sciences University (NFSU) campuses across the country. NFSU will expand to 28 states and all

Union Territories, providing essential educational and training resources to build a skilled forensic workforce nationwide. Additionally, new Central Forensic Science Laboratories (CFSLS) will be set up to assist with state-level and national-level investigations, ensuring timely and accurate forensic analysis. The Delhi campus of NFSU will also undergo infrastructure upgrades to enhance its capacity for conducting advanced forensic research and supporting complex criminal investigations.

ACCOUNTABILITY IN THE NEW CRIMINAL LAWS

Accountability measures within the BNSS, BNS, and BSA address various stages of the criminal justice process, from the registration of complaints to the handling of evidence and the oversight of law enforcement actions. These provisions hold police officers, prosecutors, and other officials accountable to ensure procedural integrity and public trust.

The key accountability mechanisms in the new criminal laws are designed to ensure efficiency, transparency, and fairness in the justice system. The BharatiyaNyayaSanhita (BNS) defines complex offences such as mob lynching, terrorism, and crimes against women with greater precision, reducing ambiguity and enabling law enforcement agencies to better understand and apply legal provisions. This clarity enhances accountability and helps ensure that the laws are implemented consistently.

The BNS also establishes strict timelines for investigations, promoting efficiency and ensuring that justice is delivered promptly. These deadlines prevent unnecessary delays, thus making the judicial process more accountable. Section 173 of the BNS mandates that all complaints, including electronic ones, must be formally registered by the police, regardless of where the offence occurred. A time-bound preliminary inquiry is required for certain offences, ensuring that complaints are handled promptly and appropriately.

Accountability in evidence handling is strengthened through the Bharatiya Sakshya Adhiniyam (BSA), which sets rigorous standards for the chain of custody, particularly for digital evidence. This ensures that evidence remains credible and reliable when presented in court, preventing tampering and ensuring the integrity of legal proceedings.

The BNSS also outlines specific rights for detainees, including access to legal representation and timely medical checkups. This provision holds law enforcement officials accountable for any abuse of power, ensuring the humane treatment of individuals in custody and protecting their fundamental rights.

Under BNSS, investigations must be completed within 90 days, with extensions only granted by court approval. Additionally, law enforcement officers are required to keep victims and complainants informed about the progress of investigations within this time frame. This time-bound approach enhances transparency and ensures that victims are engaged in the process.

The new laws also set strict timelines for the prosecution of civil servants, ensuring that cases involving public officials are expedited and concluded fairly. This measure reinforces accountability within the public sector.

To further enhance accountability, BNSS encourages the inclusion of community representatives in police oversight bodies. This external layer of accountability helps build trust in the justice system by ensuring that law enforcement practices align with public expectations and remain transparent.

Additionally, BNSS establishes a Directorate of Prosecution at the district level, tasked with case monitoring. The prosecution process is divided by case severity, with the Director handling cases with over 10 years of sentencing and the Deputy Director managing cases with over 7 years of sentencing. This structured oversight ensures that prosecution efforts are effective and aligned with the pursuit of justice.

Finally, the BNSS mandates specialized training for police officers on ethical standards, bias, and accountability. This training aims to foster a culture of fairness and responsibility within law enforcement, reducing the risk of misconduct and ensuring that officers act in accordance with ethical standards.

USHERING TRANSPARENCY IN THE CRIMINAL JUSTICE PROCESS

The new criminal laws implement specific measures to ensure that the justice process is open, understandable, and accessible to the public, promoting accountability across all stages of law enforcement and judicial proceedings.

The Bharatiya Nyaya Sanhita (BNSS) mandates the mandatory audio-video recording of all search and seizure operations under Section 105. These recordings must be submitted to the magistrate via the e-Sakshaya App within 48 hours, providing a documented record that ensures proper procedures are followed and protecting the integrity of evidence collection.

Section 176 of BNSS requires forensic experts to be present at crime scenes for cases carrying punishments over seven years. Their attendance must be documented through videography to ensure that evidence handling is scientifically validated and transparent, fostering trust in the process.

Additionally, the Bharatiya Sakshya Adhiniyam (BSA) standardizes evidence collection methods, ensuring consistent and transparent handling of evidence, minimizing risks of tampering, and bolstering public trust in forensic practices.

BNSS also emphasizes transparency in court proceedings. Section 105 promotes open court processes and media access to case information, allowing the public to monitor judicial actions and adding an important layer of oversight. Section 193 of BNSS mandates the digitization of court records, making them publicly accessible, which further enhances transparency by allowing citizens to track case progress and outcomes.

To modernize the judicial process, BNSS introduces the use of electronic trials, inquiries, and proceedings under Section 530. This provision allows for faster, more accessible proceedings, with electronic summons sent through SMS or email to expedite communication and enhance transparency.

The BSA updates admissibility rules for evidence, including digital and electronic records, modernizing the evidentiary framework. By ensuring that relevant digital evidence is considered in trials, the BSA strengthens the transparency and accountability of legal proceedings. Judicial officers are also granted enhanced powers to oversee investigations and direct law enforcement actions, ensuring that legal standards are followed throughout the justice process and promoting overall transparency.

Victims and the accused are granted access to critical case documents, such as FIRs, charge sheets, and witness statements, within 14 days of being filed in court. This provision ensures that all parties are well-informed, safeguarding the rights of both victims and the accused while promoting transparency. Furthermore, the BNS mandates regular public reporting on crime statistics and police performance, allowing citizens to monitor law enforcement effectiveness and fostering a culture of accountability.

To further enhance transparency, BNSS establishes an independent authority for reporting police misconduct, ensuring that citizens have a reliable platform to address grievances. This authority strengthens accountability and provides an external layer of oversight. Additionally, BNSS requires police departments to publicly disclose information about officer-involved incidents and complaints, ensuring that police conduct is subject to public scrutiny, which in turn builds community trust and promotes a transparent law enforcement environment.

DELIVERING JUSTICE THROUGH NEW LEGAL PROVISIONS

The new criminal laws incorporate a variety of measures designed to address pressing issues in the criminal justice system, from improved definitions of crimes to mechanisms that protect the rights of victims and witnesses. These measures are structured to ensure that justice is both fair and adaptable to modern social realities.

The Bharatiya Nyaya Sanhita (BNS) places special emphasis on crimes against women and children by introducing a separate chapter dedicated to these offences. These cases must be completed within 60 days of receiving information, ensuring swift and sensitive handling of these particularly vulnerable victims. In line with modern societal issues, the BNS revises crime definitions, including sexual intercourse obtained through deceit, caste- or race-motivated murders, organized crime, and mob lynching. This clarification ensures clearer legal grounds and more effective prosecutions.

The BNS also embraces gender neutrality and inclusivity by incorporating transgender individuals within its gender definitions and allowing women to be charged with crimes such as voyeurism, outraging modesty, and illicit intercourse. These changes reflect a broader, more inclusive approach to justice. Furthermore, the BNS sets higher standards for arrest procedures. Officers must record specific reasons for arresting individuals in cases of crimes with punishments of less than seven years, and for offences punishable by under three years, approval from a DSP-level officer is required. This provision aims to prevent arbitrary arrests and protect individual rights.

Reforms also extend to police custody, where officers can now request up to 15 days of custody for investigations. This extension gives law enforcement adequate time to gather evidence and conduct thorough interrogations without rushing the process. Additionally, community service is now recognized as a form of punishment, offering offenders an opportunity for rehabilitation while contributing positively to society.

The BNS also introduces provisions for trial in absentia under Section 356, allowing a trial to proceed if the accused is evading arrest, ensuring that justice is not delayed by the accused's non-compliance. To deter serious offences, mandatory minimum sentences have been introduced for crimes like human trafficking. These sentences reinforce the seriousness of these crimes and ensure offenders face significant penalties.

The BNS enforces time-bound completion of court proceedings under Section 258. Charges must be framed within 60 days of the first hearing, and judgments are to be passed within 45 days of trial completion. This ensures that cases are resolved in a timely manner, improving efficiency in the justice process. Additionally, the establishment of special courts for serious offences such as sexual violence and

terrorism allows for faster resolutions and specialized support for victims. Fast-track courts for minor offences, as introduced under Section 283, help clear case backlogs and expedite justice.

Bail provisions have been introduced for under-trial prisoners, allowing first-time offenders to apply for bail after serving one-third of the maximum sentence. Jail superintendents are also empowered to assist undertrials in applying for bail, ensuring a more humane and equitable justice process. The reforms prioritize a victim-centric approach, ensuring the safety and rights of victims are safeguarded throughout the legal process. This is further supported by mandatory victim compensation mechanisms, providing immediate relief and financial support to victims of crime.

Witness protection provisions have also been strengthened under Section 398 of the BNSS, with a dedicated Witness Protection Scheme that shields witnesses from threats and intimidation, ensuring their reliability in court. The new laws also allow successors to testify in place of public servants, police officers, or experts who prepared crucial documents but are unable to attend trial. This provision ensures that essential evidence is not overlooked and promotes judicial efficiency.

Defendants now have the right to challenge the admissibility of evidence in court, ensuring that all evidence meets strict standards of reliability. Lastly, the BNS encourages citizen involvement in the justice process through mechanisms like victim impact statements, which allow the public to provide input on sentencing. This promotes a balanced approach to justice, considering the broader impact of criminal acts on society.

WAY FORWARD AND FUTURE PROSPECTS

The criminal justice reforms mark a significant step forward, but to fully realize their potential, several key areas need to be addressed to ensure the system remains responsive, ethical, and aligned with technological advancements. First, effective implementation of these reforms requires robust capacity building and technological development. Law enforcement agencies must invest in ongoing training programs to enhance the digital and forensic capabilities of their workforce. Establishing the right technological infrastructure is equally important, as it will support the accurate handling of evidence and foster ethical conduct throughout the justice system.

As digital forensics and DNA profiling become increasingly vital in investigations, privacy and data protection must be prioritized. The use of DNA databases and digital evidence raises significant privacy concerns, necessitating comprehensive data protection policies. The criminal justice system must strike a balance between effective

crime resolution and safeguarding individual rights, with protocols in place to protect personal data from misuse.

Reliability in forensic methods is another critical area for reform. Forensic techniques, particularly in the realm of DNA and digital evidence, must be continuously validated to ensure their accuracy. False positives and errors in evidence handling could lead to wrongful convictions, making it essential to implement standardized procedures and quality control within forensic labs to maintain scientific rigor and fairness.

The use of technology in criminal investigations also brings the risk of evidence tampering or misuse. To prevent these risks, ethical practices, standardized procedures, and strict monitoring must be enforced. Regular oversight and training in ethical standards will help ensure that technology is used appropriately, maintaining the integrity of the justice process.

Emerging technologies such as artificial intelligence (AI), machine learning, biometrics, and predictive forensics hold tremendous promise for the future of criminal justice. These technologies can aid in crime pattern recognition, improve identification accuracy, and enhance investigative processes. However, it is crucial to develop ethical guidelines to govern their use, ensuring they do not introduce biases or result in wrongful applications.

To keep pace with technological advancements, ongoing legal revisions are necessary. The law must continuously evolve to address innovations in digital evidence, forensic methods, and investigative technologies. Regular updates to legal frameworks will help maintain an effective and relevant justice system in the face of rapid technological change.

Finally, inter-agency collaboration is essential for the effective management of complex criminal cases. Law enforcement agencies must strengthen data-sharing initiatives to enhance coordination and tackle crime more effectively. Building secure, integrated systems for data exchange will support a unified approach to crime-fighting and enable more efficient investigations across different jurisdictions.

CONCLUSION

The recent reforms represent a milestone in modernizing India's criminal justice system, yet the journey toward a fully fair, transparent, and accountable system is ongoing. By focusing on capacity building, privacy safeguards, reliable forensics, and ethical technology usage, India can build a criminal justice framework that is resilient, adaptable, and just. As we move forward, integrating these reforms with the latest

advancements in forensic and digital technology will position India as a global leader in a transparent, accountable, and efficient criminal justice system that serves both justice and public trust.

About the Author

The author is currently serving as the Commissioner of Police, Mangaluru City, Karnataka.



SHAPING TRANSPARENT JUSTICE: THE CONVERGENCE OF FORENSIC INNOVATION AND ACCOUNTABILITY IN INDIA'S NEW CRIMINAL LAWS

Himanshu Dixit

ABSTRACT

The interesting feature of the New Laws is that they have provided the mandatory presence of a 'Forensic Expert' at the scene of the crime which could be a – physical setup in a set of offences that have at least seven or more years of imprisonment as punishment (as per the Section 176(3) BNSS) or could also be a virtual setup for any offence where the cause of action is some or other way related to electronics or communication or computer output or data or device (with any form of punishments) which require the admission of any form of retrieved electronic evidence (as per the Section 63 BSA). Given the above insertions, it is thus very obvious that in every next crime that occurs in a city, a need for a forensic expert may be felt quite occasionally. A Forensic Expert's need may be required at the investigation stage as well in addition to the need during the inquiry or trial stage by the court. This research paper deals with the potential challenges that forensic advancement poses to law enforcement based on primary and secondary data and studies and concludes with solutions.

INTRODUCTION

Truth, Evidence, and Justice are the cornerstone of creating a just decision-making (or judicial) process. Truth is the quintessence of justice and evidence is the fulcrum to reach out the truth behind a fact. Probity of evidence is the baseline of scientific investigation. A person released by the court due to a lack of evidence is termed acquitted, while someone proven innocent despite the presence of adversarial evidence is termed exonerated, meaning thereby, a person who is exonerated is much more respected in the eye of moral law than the one who is merely acquitted. Indian judiciary does not firmly believe in differentiating the two terms as we lack robust institutional mechanisms for claiming remedy against wrongful incarceration and conviction.

A judge's judgment is not always synonymous with justice. There is always a fair chance of impropriety in delivering judgments by a court, which increases the gap between judgment and justice primarily for two reasons: (1) Judicial Error: This occurs due to a failure on the part of the presiding officer of the court. (2) Evidence-Related Error: This arises when the judge is unable to achieve justice in a case due to a lack of

scientific temperament, probity, transparency, and quality in the evidence presented. The concept of scientific temper in evidence collection is crucial, exemplified by the well-known story of King Solomon's justice.¹ Thus the modern criminal justice administration should be strongly based more on scientific temperament and forensics than on ocular evidence.

As per the report of 'Crime in India,' as was published by NCRB, the country has been witnessing a meagre of 43.8 percent (Murder), 27.4 percent (Rape), 23.3 percent (Crime Against Women) conviction rates in serious offences-related incidents despite the fact that elements of forensics had been playing its role in rape and allied matters even in the CrPC since past many years. In contrast, the current conviction rates are 62% in Canada, 93% in Israel, 80% in the UK, and 90% in the USA. India aims to align its goal with that of the Government of India, targeting a conviction rate exceeding 90%.²

The 239th Law Commission Report (2012) identified the poor quality of police investigations as one of the main reasons for the low conviction rate of crimes in India.³ This gap exists because police personnel, who are a critical part of the criminal justice system, lack proper training and expertise to meet the evolving demands of the investigation process. Criminals are now using advanced technology to commit crimes, placing them far ahead of law enforcement agencies.⁴ The New Criminal Laws⁵ have introduced many provisions that provide scope for forensic investigation – most of which will be discussed in the course of this paper.

FORENSIC ADVANCEMENTS UNDER NEW LAWS: INSIGHTS AND ANALYTICAL PERSPECTIVES

THE CRYING DEMAND OF FORENSICS UNDER S. 176(3) BNSS

Section 176(3) of the BNSS introduces a significant requirement, especially for offenses punishable by 7 years or more. The law requires the police station officer-in-charge to have a forensic expert visit the crime scene and collect evidence. This must be done within a 5-year period as notified by the state government. The goal is to systematize

¹ In this biblical tale, two women came before King Solomon, both claiming to be the mother of a baby. To resolve the dispute, the wise King proposed cutting the baby in half and giving each woman a portion. One woman agreed to this, while the other pleaded for the baby's life, begging to give the child to the other woman instead. Recognizing the woman who showed compassion as the true mother, King Solomon declared her the rightful caregiver, demonstrating his profound wisdom and insight into human nature. This story illustrates Solomon's ability to discern the truth and make judgments that reveal the moral character of those involved.

² Press Information Bureau, "Cabinet approves Central Sector Scheme "National Forensic Infrastructure Enhancement Scheme" (NFIES)" (Government of India, Jun. 19, 2024), available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=2026704> (last visited on July 10, 2024).

³ Law Commission of India, "239th Report on Reforming the Criminal Justice System," (2012).

⁴ Sadhna Gupta and Meghali Das, "Criminal Investigation Of Electronic Evidence: Challenges Faced With Digital Forensics" 2(2) *NFSU Journal of Forensic Justice* 2023.

⁵ The three major criminal laws as referred in this research paper as 'New Laws' are as follows: "Bharatiya Nyaya Sanhita" (BNS), "Bharatiya Nagrik Suraksha Sanhita" (BNSS), and "Bharatiya Sakshaya Adhinyam" (BSA).

the collection of critical forensic evidence to strengthen criminal investigations. Additionally, the SHO must also ensure that the process is videographed using a mobile phone or any other electronic device mandatorily. This segment of the use of audio-video technology will be discussed in detail in the next sub-chapters of the research.

Furthermore, this provision grants powers to a State Government to notify the utilization of forensic facilities from another state until a forensics facility is established in that state. For certain severe crimes, it is imperative that forensic science investigations be made mandatory to eliminate the use of third-degree torture.

The application of Forensic Science in criminal investigation is no more a *res integra*. Prior to the enactment of the BNSS, Delhi and Karnataka (the second state to follow Delhi) had already mandated compulsory forensic investigations for crimes in urban areas with punishments exceeding six years.⁶ In forensic aspect, already much before the enactment of the New Laws; the Central Government had been collecting fingerprints of all criminals and storing them in the National Automated Fingerprint Identification System (NAFIS), which maintains a repository of over 15 million records. Within just three months of its implementation, the data from this repository helped resolve 10,000 previously unsolved cases, and thus, handling, recording, processing and storing of all such forensic data would increase the coverage of forensics in the criminal justice administration, thus requiring more such facilities and manpower.⁷

STATISTICS REGARDING NEED FOR FORENSIC VISITS DURING CRIME SCENES

As of 2023, India's forensic science infrastructure comprises of total 145 FSLs- with 7 central forensic labs, 32 state forensic labs, and 106 regional forensic labs. In addition to this, there exists 552 Mobile Forensic Science Units, as per the DFSS report released in 2023.⁸

It is important to understand that out of the total 296 offences in IPC, 98 offences had a punishment of seven years or beyond, while as far as some 49 Minor Criminal Acts (POCSO Act, Arms Act, etc.) are concerned, there are total 131 offences for which punishment are seven years or beyond. Refer to the **Figure 1** below.

⁶ BPR&D Bureau, "Forensic Science Accelerates Conviction Rate" 4 *Vigilant India* 5-9 (2023).

⁷ Gururaj Jamkhandi, "India will need 90,000 forensic scientists in 9 years: Amit Shah" *The Times of India* (Jan. 29, 2023), available at: http://timesofindia.indiatimes.com/articleshow/97408206.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst (last visited on July 10, 2024)

⁸ Directorate of Forensic Science Services, Ministry of Home Affairs, "DFSS Report 2018-22" 6 (2023).

Sl	IPC/Minor criminal acts	Total offences	Punishment	
			>7 years	≤7 years
1	Indian Penal Code	296	98 (33%)	198 (67%)
2	Minor Criminal Acts (49)	131	45 (34%)	86 (66%)
Total		427	143 (33.4%)	284 (66.6%)

Source: S. Mohanty, Police Discretion in India: Legal and Extralegal Factors **Figure 1**

As far as the break-up for the offences above seven years and more under the BNS is concerned, there are at least 138 such offences (if each Section is just understood as one offence (with seven or more punishments) clause). This becomes 185 if all the distinct offences (with seven or more punishments) even inside each section are counted as a distinct offence altogether. Thus, for the purpose of estimation, if it is considered that there are at least 138 Offences having seven years or above as the punishment under the BNS, as per Section 176(3) of BNSS, a need for the forensic expert is required in all such offences at least twice- one at the crime scene and second at the forensic laboratory where the collected forensic samples would be examined by a distinct forensic expert.

The initiative of the New Laws to emphasise the usages of forensics is a good step but there are still three major challenges looming this:

Firstly, with the number of offenses carrying a minimum punishment of seven years rising significantly from 98 under the IPC to 138 (approximately) under the new BNS framework, there has been an approximate 42% increase in the crimes necessitating the presence of a forensic expert. Consequently, according to Section 176(3) of the BNSS, a total of 183 offenses now requires mandatory forensic expertise (at least two times in a case i.e. first at the crime scene level and second at the forensic laboratory level), combining 138 offenses under the BNS and 45 additional offenses under the Minor Criminal Acts as on July 2024.

Interestingly, the Office of the Karnataka Director General and Inspector General of Police, which introduced a circular in 2022 for compulsory forensic visits for offences with imprisonment clauses of seven years or more, issued guidelines to investigation officers (to be enforced by the Deputy Commissioner of Police) posted in police commissionerates. These guidelines mandate the use of forensic services at the scene of the crime for certain offences that attract a punishment of seven years or more.⁹ The

⁹ Office of the Director General and Inspector General of Police, Karnataka Circular No: EST(2)/14/ADGP(C&TS)/2022-23 dated 22.11.2022, "Guidelines For Mandatory Forensic Investigation In Certain Heinous Cases reg." (November, 2022).

above Circular indicate that police Investigation Officers in Karnataka had been given sufficient discretion to bypass forensic investigations. However, with the enforcement of the BNSS, there has been a significant change. For all offences punishable by seven or more years, forensic investigations will now be mandatory from the outset of the crime scene analysis for all state police officials, leaving minimal to no scope for the officers' discretion.

Secondly, an in-depth analysis of the 138 offences under the BNS reveals that for many of these crimes, the presence of a forensic expert at the crime scene may not be necessary. This situation could create a dilemma for SHOs regarding the implementation of the mandate, which requires a forensic expert to be present for offences punishable by seven years or more. This particular issue has also been highlighted as a concern by some respondents in the field research. In Haryana, as per a news report,¹⁰ during the initial six months of 2024, Haryana's mobile forensic vans visited a total of 3,366 locations. Among these, 1,376 pertained to cases involving potential sentences of seven years or more. As per BNSS, it is a must to have forensic visits for all such cases.

Thirdly, as Section 176(3) BNSS imposes a mandatory duty (effective from either the end of the five-year preparation period or the date the State Government notifies) upon the SHO to arrange for a forensic expert's visit for cases involving imprisonment of seven years or more, there must be a well-maintained symphony and collaboration between forensic experts and police investigation officials. Around 93 percent of the anonymous police officers who were asked through a questionnaire (refer to **Figure 2**) acknowledged this concern and expressed fears of encountering challenges similar to those previously faced between the police and public prosecutors.

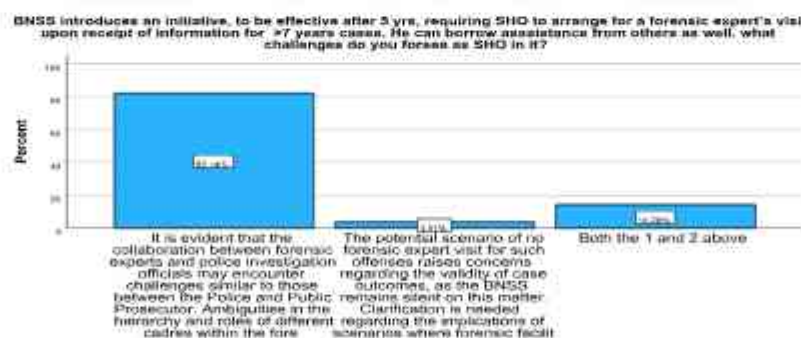


Figure 2

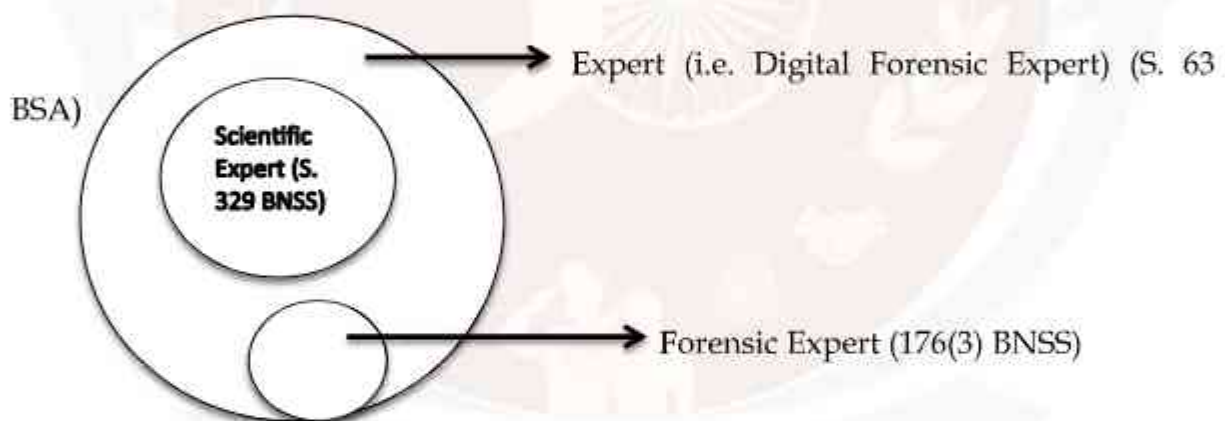
As a solution to the third issue, 93 percent of the respondents proposed that to avoid any ambiguity in the hierarchy and roles of different cadres within the forensic and

¹⁰ Mahesh Buddi, "New Criminal Laws to Increase Workload of Forensic Experts in Haryana" *The Times of India* (July 5, 2024) available at: <https://timesofindia.indiatimes.com/city/gurgaon/new-criminal-laws-to-increase-workload-of-forensic-experts-in-haryana/articleshow/111442824.cms> (last visited July 06, 2024).

police wings, which could hinder effective cooperation in investigations, careful attention is needed to delineate clear hierarchies, roles, responsibilities, and authority boundaries between the two services.

On average, based on responses recorded during the field research, it was observed that a typical police station in Uttar Pradesh has about 30-40 police officials, including 8-10 Investigation Officers. Given the reliance on forensic analysis in criminal investigations under the New Laws, as explained above, it is expected that at least one forensic expert is needed for every two Investigation Officers, particularly since they handle offences with punishments of seven years or more. According to this estimate, a minimum of 85,000-90,000 forensic experts are required in the country. This estimation is supported by the Indian Home Minister's statement, which indicated that the country will need over 90,000 forensic experts within the next nine years.¹¹

WHO IS A 'FORENSIC EXPERT'? - A CONSPIRACY OF SILENCE



The Section 45 of the erstwhile IEA (now Section 39 of BSA) permits reliance on expert opinions in various specialized fields, including forensic science. According to landmark case laws for Section 45 IEA, such as *State of Himachal Pradesh v. Jai Lal*¹², an individual must possess specialized skills, qualifications, and experience in their area of expertise to be considered as an 'expert'.

In Section 39 of BSA (S. 45 of IEA), the scope of an expert has been expanded to include individuals especially skilled in "any other field." The law, specifically Section 41 of the BSA (Section 47 of the IEA), allows handwriting evidence to be admissible even from individuals who are not professionally trained forensic experts. The only

¹¹ Gururaj Jamkhandi, "India will need 90,000 forensic scientists in 9 years: Amit Shah" *The Times of India* (Jan. 29, 2023), available at: http://timesofindia.indiatimes.com/articleshow/97408206.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst (last visited on July 10, 2024)

¹² (1999) 7 SCC 280.

requirement is that the person be familiar with the handwriting in question. This indicates that expertise in handwriting analysis does not solely come from formal academic qualifications. Rather, the law acknowledges that expertise can also be developed through informal training, practical experience, ongoing practice, and close observation. The implication is that specialized skills and knowledge relevant to handwriting identification can be acquired through means other than just traditional academic or professional credentials.

Legal qualifications for serving as an expert witness vary widely from country to country. Even in the United States of America, this definition of 'who is an expert' varies from State to State. In cases of no clear-cut definitions being provided by the legislatures in the USA, the Federal Court-based case laws defined standards are applied which are often less stringent than those of many state statutes and regulations. For instance, Federal Rule 702 on Evidence of the USA Parliament only requires that an individual be deemed an expert based on their knowledge, skill, experience, training, or education, without specifying further categories. While very few states define qualifications, mandate medical licensure, and few demand certifications, several mandate a certain number of years of standing in the field. While it is expected that medical experts testifying in malpractice cases have relevant knowledge, experience, training, or certification, few states legally require such extensive qualifications for these medical experts. Some states require only licensure, and in some cases, no specific licensing requirement is necessary.

The plain reading of the explanation to Section 39 of BSA provides that an 'Examiner of Electronic Evidence' shall be an expert who shall assist the court in the proceedings pertaining to the electronic evidence. These Examiners of Evidence are notified as experts under Section 79A of the IT Act and they come to assist in a matter only when the matter has reached the stage of a trial as it is only the court (and not the police officer for the purpose of Section 63 of BSA) which can order or seek their services as per the textual interpretation of the Section 39 of BSA. As per the latest information available on the website of the Ministry of Electronics and Information Technology (MEITY) as of July 2024, less than 20 out of 145 forensic laboratories available across India,¹³ encompassing various regions and specialized needs have been notified by MEITY as 'expert as examiner of electronic evidence', the rest either do not have such standard¹⁴ or has not shown any interest yet.

¹³ Directorate of Forensic Science Services, Ministry of Home Affairs, "DFSS Report 2018-22" 6 (2023).

¹⁴ MEITY, "Scheme for Notifying Examiner of Electronic Evidence Under Section 79A of the Information Technology Act 2000", available at: <https://www.meity.gov.in/writereaddata/files/annexure-i-pilot-scheme-for-notifying-examiner-of-electronic-evidence-under-section-79a-of-the-information-technology-act-2000.pdf> (last visited on July 01, 2024).

In addition to the above, it is crucial to highlight that sub-section (4) of Section 63 of the BSA upholds the necessary requirement for a certificate as stipulated under erstwhile Section 65B (4) IEA.¹⁵ This sub-section clarifies that the Certificate must be furnished alongside the electronic record every time e-evidence is brought before the court. The phrase 'an expert' hereby refers to the forensic expert and thus what modalities are required to deal with this. Can a private person be allowed to act as an expert or anyone who is capable or possessing basic abilities or experiences may be allowed to act as a forensic expert? In Telangana and Andhra Pradesh, as per the response recorded by a former serving police officer of the state of Telangana, the researcher was informed that to assist police in forensic investigation, a company run by a retired police officer named TRUST LABs is involved in assisting in forensic analysis/investigations by acting as forensic expert wherever required.

In India, it is a general phenomenon that many people claim themselves to be an expert. The absence of any concrete definition or feature of 'an expert' for the purpose of the criminal forensic investigation - which is a core sovereign function of the state - a 'conspiracy of silence' is created thereby making it challenging to find the 'reliability' aspect in the forensic testimony. Given the absence of specificity in the definition of an expert under BNSS and BSA, it is generally very easy today to hunt experts willing to testify in such a field.

A Forensic Expert should never be working primarily for financial gain as is usually the case in private forensic laboratories. While it is ethically acceptable for physicians to receive reasonable compensation for their time spent analysing or testifying in a case, financial motives should not be the primary driver behind their expert witness work.¹⁶ Crime Scene Management is a part of investigation which is a voyage for discovery or pursuit of the truth.¹⁷ Similarly, a right to a fair investigation is a precursor to the right to a fair trial, and the accused must be given the opportunity to defend during the investigation.¹⁸

Be that as it may, the plain reading of the New Laws including the one for the purpose of Section 63 read with Part B Certificate of the Schedule to BSA provides that the term 'expert' refers not only to those establishments that are notified under Section 79A of the IT Act but also to those which are even a privately operated or may also include any person (including individuals) whosoever has adequate knowledge or have been

¹⁵ The IEA does not specify the required format for certifying secondary evidence, which is often provided as an affidavit. However, the BSA introduces Schedule A and B to serve this purpose. Part A must be completed by the party submitting the electronic or digital record, while Part B requires an expert to confirm the hash values were generated using the specified algorithms.

¹⁶ T. Baldas, "Nonexperts taking the Stand" 1 *National Law Journal* (2005).

¹⁷ *Amitbhai A. Shah v. Central Bureau of Investigation*, 2013 AIR SCW 2353.

¹⁸ *Ibid.*

specially skilled in such field of computer/cyber related forensics. This inference can be further substantiated by the recently released SoPs by the Delhi Police Chandigarh Police and BPR&D drawn from the wide provision of Section 39(1) of the BSA,¹⁹ along with the landmark judgments of courts including that of *Jailal* case as to who is to be called as an expert. Part C of this chapter provides a detailed discussion of the aspect of digital forensic evidence and the issues concerning the certificates.

As regards the term 'forensic expert' at the scene of the crime for the purpose of Section 176(3) of BNSS is concerned, in this vein, the state of Karnataka is a perfect example. In July 2021, Karnataka Police planned to recruit 196 Scene of Crime (SoC) Officers through the State Public Service Commission Examination. These officers, distinct from Forensic Experts of the Forensic laboratory and police Investigating Officers (IOs), join the Karnataka State Police Service with the pay scale of a Sub-Inspector.

Previously, local police personnel deployed on mobile forensic vans handled crime scene duties, with forensic experts from the FSL only visiting major crime scenes. This initiative is the first of its kind in India, where a dedicated group of personnel will manage the responsibilities of securing crime scenes. The SoC officers will gather crucial evidence from crime scenes, including fingerprints, DNA samples, and other types of evidence. They will preserve sensitive evidence to ensure it leads to convictions. Additionally, these officers will collaborate with forensic experts and IOs to analyse evidence and help solve crimes, thereby reducing errors in evidence collection and handling while also performing law and order duty. Each district is planned to have one SoC unit with four to five officials.

In other states, such as Telangana (with CLUE Teams) and some districts in Uttar Pradesh, crime scene management is currently handled by District Scientific and Analytical Units (DSAUs), where selected police personnel trained specifically in evidence collection are stationed. In more advanced and metropolitan districts and states in India, forensic experts from forensic laboratories, stationed in district forensic mobile labs, handle crime scene management, with limited involvement from the district police in forensic matters.²⁰ The primary purpose of such teams is often to assist in tracing or tracking down criminals, with little focus on ensuring the forensic precision necessary for successful prosecution.

¹⁹ Bureau of Police Research and Development, "Standard Operating Procedure of Audio/Video Recording of Scene of Crime" (June 2024), available at: <https://bprd.nic.in/uploads/pdf/SOP%20of%20Audio%20Video%20Recording%20of%20Scene%20of%20Crime.pdf> (last visited on July 10, 2024).

²⁰ Darshan Devaiah BP, "Explained: Role of the Scene of Crime Officers, Karnataka Police is Set to Induct" *The Indian Express* (Jul. 14, 2021), available at: <https://indianexpress.com/article/explained/explained-role-of-the-scene-of-crime-officers-karnataka-police-is-set-to-induct-7404314/> (last visited July 01, 2024).

QUALIFICATION

As discussed briefly above that since the BNSS and BSA is, by and large, silent as to any specific qualification to be termed as 'expert' or 'forensic expert', the general import of the same for BNSS and BSA would be made from considering the judgments and foreign positions.

Like the BNSS and BSA, there are several legislations²¹ in India which also has similar silence regarding who is to be an expert.²² The IEA's Section 51 establishes that expert opinion is an exception to the general rule excluding opinion evidence. However, it stipulates that such viewpoints are not *ipso facto* admissible; their reliability must be assessed based on the reasoning behind the opinion and through the examination of the expert.²³

The reliability and relevance of an expert's methodology, along with their credentials, are scrutinized in the United States in the landmark *Daubert v. Merrell Dow Pharmaceuticals*²⁴. The 1993 *Daubert* court case established the standard by which federal and many state judges evaluate expert testimony and evidence. This landmark case is considered one of the most significant in the realm of evidence law.

As a general rule in California and North California, an expert must hail from the same professional field. If an expert witness relies primarily on their experience, they must explain how that experience leads to their conclusion, why it provides an adequate basis for their opinion, and how it is reliably applied to the facts. The court has a gatekeeping role to ensure the expert's testimony is sufficiently justified, not just based on their assurances.²⁵ The U.S. Apex Court uses a two-part test for admissibility of expert evidence - the evidence must be both relevant and reliable. Even according to Rule 702 of the Federal Evidence Code,²⁶ for evidence to be admissible, it must meet these criteria. Under Rule 702, for expert testimony to be admissible, the expert must be qualified, their findings must address a subject that can benefit the fact-finder, their findings must be reliable, and the findings must be relevant to the matter at hand.

Assessing the reliability of forensic expert evidence involves examining the expert's reasoning and methodology to determine if they are valid scientific methods. This case also led to amendments in Rule 702²⁷ which imposed tougher standards for the

²¹ Motor Vehicles Act, 1988 (Act 59 of 1988), s. 169(3).

²² National Green Tribunal Act, 2010 (Act 19 of 2010), s. 4(1)(c).

²³ R. Ratanlal and K. T. Dhirajlal, *The Law of Evidence* (Wadhwa and Co., Nagpur, 23rd ed., 2010).

²⁴ 509 U.S. 579, 593-96 (1993, Supreme Court of USA).

²⁵ Terrence F. Kiely, *Forensic Evidence: Science And The Criminal Law* (CRC Press New York, 2001).

²⁶ Rule 702, provides: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise

²⁷ Federal Rules of Evidence 702, 28 U.S.C. 1975 (United States Parliament).

‘reliability’ and ‘relevance’ of expert testimony. In India, under the notion of reliability of an expert, the factors for consideration are: assessing the credibility and qualifications of an expert witness. A universal, one-size-fits-all approach for evaluating all scientific evidence is impractical, as each scientific technique is at a different stage of inquiry, with varying tools, assumptions, methodologies, and goals.²⁸

In the USA, determining whether someone is qualified to be an “expert” or not and what weight has to be given to that testimony is the judge’s prerogative. Similarly, in Indian courts, an expert’s opinion is not substantial evidence on its own and can only be corroborative²⁹. An expert’s credibility in India is judged by their educational background, qualifications, experience, and recognition in their field. Although there is no formal standard, Indian courts have occasionally followed the *Daubert* guidelines when in doubt.³⁰ Indian courts often rely on legal transplants and international precedents, particularly the *Daubert* standard, to define admissibility criteria within Indian jurisprudence.

In *Dharam D. Yadav v. State of U.P.*³¹, the Apex Court emphasized the need for the Indian judiciary to adopt modern technology and innovative scientific methods for evidence analysis. The court stressed that while traditional methods are outdated, scientific evidence should be promoted to strengthen crime detection. The *Daubert* case factors for determining the reliability and relevance of evidence were mentioned to support this stance. In the case of *Nnadi K. Iheanyi v. Narcotics Control Bureau*³², the Supreme Court recognized the importance of the dual test of admissibility established in *Daubert*. The court noted the necessity of its gatekeeping role in screening evidence to ensure its relevance and reliability.

GROUND REALITY

The general understanding on the field currently is that any person be it police personnel trained in forensics, SoC Officers of Karnataka Police Forensic experts, or the in charge of Mobile Forensic Vans if are made especially skilled in such forensics (some seventeen divisions exist in forensic science) field, would be termed as ‘Forensic Expert’.³³

²⁸ M. M. Kapsa and C. B. Meyer, “Scientific Experts: Making Their Testimony More Reliable” *California Western Law Review* 313 (1999).

²⁹ *Malay Kumar Ganguly v. Dr. Sukumar Mukherjee*, AIR 2010 SC 1162.

³⁰ Dr. M.P. Kantak, Ghodkirekar and S.G. Prerni “Utility of Daubert Guidelines in India ” 26(3) *Journal of Indian Academy of Forensic Medicine* (2004).

³¹ (2014) 5 SCC 509.

³² (2014) 145 DRJ 267).

³³ *Bhartiya Sakshya Adhiniyam*, 2023 (Act 47 of 2023), s. 39.

The hired forensic experts generally have a minimum qualification of a Master's in the subject as per most of the recruitment advertisements in India. However, the SoC Officers of Karnataka Police have either a Bachelor's Degree in forensics or a year's Diploma in forensics alongside a Bachelor in Science as the minimum qualification.³⁴ However, the important issue of qualification may arise when an average police official (who has just a Bachelor's or Master's Degree in even arts) when posted in the forensic department after departmental training in forensics starts acting as a Forensic Expert.

In forensic science, proficiency in the specific forensic discipline and the particular technique or method employed in the examination of a case is a *sine qua non*. The entire field and functioning of forensics are based on a 'not taken for granted' approach, and thus assessing the qualifications, training, and recruitment criteria of forensic examiners becomes more and more important in the first place while also giving due weightage to examiner's method and chain of custody of collecting, processing and storing the evidence.

Nonetheless given the need for forensic expert's presence on the field, the strength of forensic experts needs to be increased to accommodate the need for the New Laws. In this direction, the Home Department of Delhi³⁵, Haryana³⁶ and Madhya Pradesh³⁷ have already begun their drive to recruit scientific experts in their forensic laboratories from first half of the year 2024, and thus other states need to follow the suit soon without waiting for the statutorily provided five-year preparation period time to end.

But in every such effort, the legal position is to be respected that not only the experience and training but also the education in the relevant field must be accounted for when a person is to be called a 'Forensic Expert' for BNSS and BSA.

³⁴ Directorate of Forensic Science Laboratories, Karnataka State Police, "Application For The Post Of Scene Of Crime Officer (SoC Officers)" (2021), available at: <https://dfsl.karnataka.gov.in/39/application-for-the-post-of-scene-of-crime-officer-%28soco%29/en> (last visited July 01, 2024).

³⁵ Atul Mathur, "Delhi Government Hires 150 Forensic Experts to Strengthen Crime Investigations" *The Times of India* (Jul. 13, 2024), available at: <https://timesofindia.indiatimes.com/city/delhi/delhi-government-hires-150-forensic-experts-to-strengthen-crime-investigations/articleshow/111700291.cms> (last visited July 13, 2024).

³⁶ Mahesh Buddi, "New Criminal Laws to Increase Workload of Forensic Experts in Haryana" *The Times of India* (July 5, 2024) available at: <https://timesofindia.indiatimes.com/city/gurgaon/new-criminal-laws-to-increase-workload-of-forensic-experts-in-haryana/articleshow/111442824.cms> (last visited July 06, 2024).

³⁷ Karishma Kotwal, "47% of Forensics Scientist Posts in Madhya Pradesh Vacant, Posing Hurdle for New Law" *The Times of India* (Jul. 5, 2023), available at: <https://timesofindia.indiatimes.com/city/indore/47-of-forensics-scientist-posts-in-madhya-pradesh-vacant-posing-hurdle-for-new-law/articleshow/111416891.cms> (last visited July 06, 2024).

CHALLENGES IN IMPLEMENTING FORENSICS-RELATED PROVISIONS OF NEW LAWS

Indian forensic scenario is suffering from several challenges. Project 39A of the National Law University, (NLU) Delhi has done an empirical study on the forensic infrastructure of India and published its report in August 2023. As per the report³⁸, of the 3,211 sanctioned posts for 26 FSLs, 40% remain vacant. Recruitment delays force these laboratories to hire temporary contractual staff. Without these contractual hires, the proportion of filled scientific posts would drop from 63% to 52.5%. According to the Comptroller and Auditor General's audit report on the "Modernisation and Strengthening of Police Forces in Uttar Pradesh" 2017, forensic science lab facilities are 'highly inadequate' in the state, compounded by budget underutilization and bureaucratic delays.

VACANCY AND INFRASTRUCTURE

According³⁹ to the Forensic Science India Report by Project 39A at NLU Delhi,⁴⁰ 901 out of 2,357 scientific posts in forensic agencies (including state and center) are currently vacant. The report indicates that at least 900 more forensic science positions need to be created. Additionally, the lack of a regulatory body and low pay scales have led to inconsistent training practices and low occupancy in these scientific roles. The timely submission of FSL reports has always been an issue despite multiple reminders by the courts and by the ministry.⁴¹

The Punjab & Haryana High Court, concerned about alarming delays in forensic report preparation and dispatch, constituted a committee to investigate the functioning of the Forensic Science Laboratories in Haryana and probe officials' culpability in causing these delays and errors.⁴² The Delhi High Court noted in a matter that the delay in receiving scientific investigation reports not only comes with a huge social cost but also leads to extreme suffering for the stakeholder's family as they completely remain unaware of the exact cause of death. The Kerala High Court has also echoed the same concern in the past.⁴³ Even the Supreme Court of India has also given its observation about such a rampant issue in a matter.⁴⁴

³⁸ Project 39A, NLU Delhi, "Forensic Science in India: A Study on its Infrastructure and Utilization in the Criminal Justice System", (August, 2023), available at: <https://www.project39a.com/fsir-report> (last visited July 05, 2024).

³⁹ Shreehari Paliath, "What Really Is Holding Back Forensic Science in India?" *The Wire* (Aug. 22, 2023).

⁴⁰ Project 39A, NLU Delhi, "Forensic Science in India: A Study on its Infrastructure and Utilization in the Criminal Justice System", (August, 2023), available at: <https://www.project39a.com/fsir-report> (last visited July 05, 2024).

⁴¹ Directorate of Forensic Science Services, MHA, "Standard turnaround time for reporting in cases referred to CFSLS for forensic investigation-reg.", available at: <http://dfs.nic.in/pdfs/turnaround%20time.pdf>

⁴² *State of Haryana v. Vinit Yadav*, CRM-M-41613-2023 (Punjab and Haryana High Court).

⁴³ *Sanjay Oraon v. State*, Bail Appl. No. 11291 OF 2023 (Kerala High Court).

⁴⁴ *State of Telangana Rep By Special Officer Vandhana v. M/s. Heera Gold Exim Private Limited*, Criminal Appeal No. 761-762 of 2021 (Supreme Court of India).

BUDGET

Another problem that is plaguing the forensic wing of the criminal justice administration is funding. The aforementioned Project 39A report also underscores that the administrative and economic oversight exercised by the respective state police offices complicates the approval process for budgets and expenditures, in contrast to Forensic Science Laboratories (FSLs) which are directly managed by home departments. Officials from FSLs have reported delays in obtaining funds under the Union government's Modernisation of Police Forces scheme, with funds frequently expiring at the end of each financial year.

PENDENCY

A Project 39A report found high pendency rates from 2013-2017 in specialized forensic disciplines like cybercrime, DNA profiling, and ballistics. This indicates a need to expand capacity in these critical departments. This is shown in **Figure 3**.

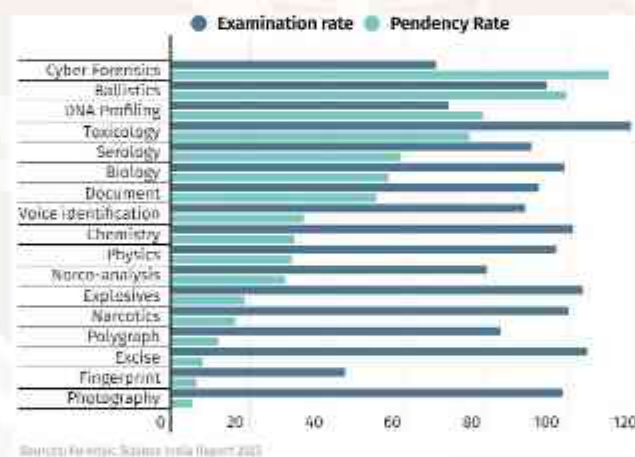


Figure 3

According to the NCRB's 'Crime in India' report, cybercrimes saw a 24.4% increase in 2021, with the crime rate rising from 3.9 to 4.8. This surge in cybercrime cases will further add to the workload on forensic labs.⁴⁵ Hence, given the requirement of certification under BSA for every digital record, such number of cybercrimes and corresponding cyber forensic needs are bound to rise.

FORENSIC FRAUD

Implanting false evidence to mislead justice or implicate the innocent is a significant concern. Forensic expert reports should not be considered infallible, despite the

⁴⁵National Crime Records Bureau, "Crime in India 2022" (December, 2023) available at: <https://ncrb.gov.in/uploads/nationalcrimerecordsbureau/custom/1701607577CrimeinIndia2022Book1.pdf> (last visited on June 1, 2024).

prevalent belief in India. With the involvement of private entities or lateral entrants in forensic duties and their exemption from oral testimony, the risk of forensic fraud is likely to increase. Additionally, bias may arise if forensic experts appointed by or affiliated with the laboratory are also responsible for conducting crime scene investigations.

When a forensic expert is present at the crime scene and subsequently examines the evidence collected within the local Forensic Science Laboratory (FSL), there is a significant risk of cognitive and contextual bias. This creates a situation where they function similarly to ‘witnesses of fact,’ which is inappropriate and undermines the integrity of forensic procedures.

Having the same forensic expert collect evidence at the crime scene and later examine that evidence at the lab poses a risk of cognitive and contextual bias. The expert may be exposed to irrelevant information during the crime scene inspection, such as the presence of accused persons, witness statements, or the gruesome nature of the scene. This task-irrelevant information could influence the expert’s subsequent analysis and findings, compromising the objectivity of the forensic examination.

CONCLUSION

Advancement of forensic investigation is a good step and it will serve as an agent of truth in the court. To mitigate risks, a forensic expert designated for crime scene investigation should ideally be stationed at the district level, in coordination with the local police’s Station House Officers. The additional requirement for mandatory forensic analysis at crime scenes under the BNSS will place significant strain on the existing state and central forensic laboratories. These labs are already tasked with handling the crucial DNA and forensic analysis needed for investigations. As a potential solution, many Public Private Partnership (PPP) model-based laboratories may be constructed and may be notified as ‘Government Scientific Experts’ under Section 293(4) of the CrPC (equivalent to Section 329(4)(g) of BNSS) for analysis of DNA samples. To move in this direction, the Union has recently launched a Central Sector Scheme named ‘National Forensic Infrastructure Enhancement Scheme (NFIES)’ in the year 2024 with a total financial outlay of Rupees 2,254.43 crore for the period from 2024-25 to 2028-29.⁴⁶ But the distribution of the funds easily after routing through so many departments is still a concern as was noted in the Project 39A report on forensics 2013-2017.

⁴⁶ Press Information Bureau, “Cabinet approves Central Sector Scheme “National Forensic Infrastructure Enhancement Scheme” (NFIES)” (Government of India, Jun. 19, 2024), available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=2026704> (last visited on July 10, 2024).

The infrastructure must be enhanced robustly at all ends be it judges, police, prosecutors, and forensic levels.

About the Author

The author is a Delhi-based advocate with prior experience as a lawyer at Trilegal. He holds a BALLB (Hons.) from NLIU Bhopal and an LLM from ILI New Delhi. He has also interned with the Committee for Reforms in Criminal Laws and was the founding Deputy Editor-in-Chief of the International Trade Law Journal (ITLJ).



INTEGRITY OF FORENSIC SAMPLES: NEW CRIMINAL LAWS AND BEYOND

Pranav Kumar

ABSTRACT

The integrity of samples is of critical importance for the admissibility of forensic evidence in any criminal proceedings. The Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023, which has come into force with effect from 1st July 2024 has taken a significant step forward by mandating that police reports submitted under Section 193 must include the sequence of custody for electronic devices. However, this provision has not been extended to other categories of physical evidence. Any tampering or manipulation of physical evidence undermines the credibility of forensic evidence in criminal investigations and may erode public trust in the criminal justice system. This paper examines the current challenges related to forensic sample integrity in India and argues for the urgent need to adopt a comprehensive chain of custody and related forensic protocols for both physical and digital evidence, reinforced by national guidelines, technology-driven solutions, and regular audits. By addressing these deficiencies, India can enhance the reliability of forensic evidence and strengthen the overall justice process, ensuring that cases are decided on solid and untampered forensic evidence.

INTRODUCTION

Forensic evidence plays a critical role in modern criminal investigations and trials, providing objective and scientifically grounded proof that can establish or refute facts in issue. However, by its very nature, forensic evidence is only as reliable as the system that preserves it. Hence, the integrity of forensic samples is paramount to ensure fair and accurate delivery of justice. This is particularly relevant in biological, narcotics, and toxicological samples but applies to all categories of physical samples. This issue has become even more significant with advancements in trace evidence forensics.

UNODC manual prescribes that "the evidence that is recovered at the scene must ultimately reach a forensic laboratory in a way that maintains its integrity and identity" [1]. Forensic sample integrity protocols need to focus on preventing tampering and manipulation and preventing degradation of samples. In the global context, countries with progressive legal frameworks have long recognised the necessity of securing forensic evidence through robust protocols. These protocols ensure that evidence, once collected, remains intact and free from contamination or tampering in any manner. The "chain of custody" concept lies at the heart of these protocols, establishing a documentary trail that tracks every interaction with the evidence from collection at the crime scene to its presentation in court [2]. Chain of custody documentation identifies the chronological sequence of movement of forensic samples and the persons who handled the samples. The chain of custody must meet both chronological and logical criteria [3], meaning that the sample's movement

through the forensic chain is tracked in sequence, and its handling at each stage is justified in the investigation, forensic analysis, or prosecution. A break in this chain can render the evidence inadmissible and may lead to wrongful convictions or acquittals. Chain of custody protocols also include measures to prevent contamination, tampering, and degradation are also critical aspects of maintaining the integrity of physical samples.

The introduction of the Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023, is a significant step towards mainstreaming forensics in criminal justice delivery. With the ubiquitous use of electronic devices in both everyday life and criminal activity, the importance of securing electronic evidence has never been more critical and the BNSS, through Section 193 dealing with reports in final form, has introduced mandatory requirements for submitting sequence of custody for electronic devices, aligning India with global best practices in this area. A sample form is provided in the Annexure 1 of this paper.

However, despite this progress, the BNSS falls short in addressing similar challenges for the integrity of other categories of physical evidence such as D.N.A., blood samples, and weapons. The process is particularly crucial for biological evidence. The recent incident involving the Forensic Science Laboratory (F.S.L.) in Pune, Maharashtra, where forensic samples were allegedly exchanged, highlights the inherent risks associated with a lax forensic chain of custody system [4]. A report by Project 39A titled "Forensic Science India Report" found that most F.S.L.s lack quality management systems and adequate contamination control protocols [5]. This situation underscores the dangers that arise when proper protocols for handling and tracking evidence are either missing or are not strictly followed. The higher judiciary in India has highlighted the importance of maintaining a chain of custody in a number of landmark cases [3]. In *Union of India vs. Mohanlal and Ors.*⁴⁷, the Supreme Court had issued directions for seizure under the Narcotics Drugs and Psychotropic Substances Act, 1985 cases with a focus on ensuring the integrity of forensic samples. Increasing emphasis on the use of forensic evidence without a comprehensive framework for handling all types of evidence is fraught with dangers of misuse of forensic practices. This assumes greater significance with the advent of technologies like "touch D.N.A." for solving criminal cases.

⁴⁷ Union of India vs. Mohanlal and anr. (2016)3 SCC 379

BNSS PROVISIONS: ENHANCING FORENSIC SAMPLE INTEGRITY

The BNSS introduces several key provisions to improve the integrity of forensic evidence in India. These provisions focus on electronic evidence, videography of evidence collection, and search and seizure processes.

SECTION 193 (2) (I): CHAIN OF CUSTODY FOR ELECTRONIC EVIDENCE

Section 193 (2) (i) of the BNSS represents one of India's most significant reforms in forensic evidence handling. The section mandates that all electronic devices, such as mobile phones, computers, and digital storage devices, should be subjected to a clearly documented sequence of custody. This chain begins when the device is seized and continues through its analysis and eventual presentation in court.

Considering the fragility and susceptibility to tampering and manipulating electronic evidence, this provision is essential to ensure integrity and admissibility. Data stored on electronic devices, whether call records, emails, or G.P.S. data, can be pivotal in establishing guilt or innocence.

Bharatiya Sakshya Adhiniyam, 2023 has also introduced the provisions for detailed certificates (Part A and B) under section 63(4)(c) including noting hash value in case of secondary electronic evidence.

The Scheme for notifying the Examiner of Electronic Evidence under Section 79A of the Information Technology Act, 2000 mandates that individuals or institutions serving as examiners of electronic evidence must meet specific ISO/IEC standards. The Scheme is aligned with international standards, such as ISO/IEC 17025 (which sets general requirements for the competence of testing and calibration laboratories) and ISO/IEC 27037 (which provides guidelines for identifying, collecting, acquiring, and preserving digital evidence). The evaluation process under this Scheme assesses several factors, including the technical expertise and skilled workforce in digital forensics, the availability of licensed tools and equipment, the suitability of the environment for carrying out evaluations, as well as the presence of a proper quality management system. The Scheme also provides for annual audits after initial approval.

ज्ञानं अनुसंधानं विज्ञानं जनसुरक्षा च - राष्ट्रसेवार्थम्

SECTION 176(3): INVOLVEMENT OF FORENSIC EXPERTS AND VIDEOGRAPHY

Section 176(3) of the BNSS expands the application of forensic science in India by introducing the requirement that a forensic expert must visit the crime scene for offences punishable by seven years or more. Considering the need to develop adequate forensic infrastructure, state governments have been authorized to issue notification within five years to enforce this provision. If a forensic facility is unavailable for any such offence, the State Government shall notify the use of a facility in another State until a local one is established. This provision ensures that trained professionals handle the evidence collection, reducing the likelihood of contamination or mishandling.

Further, the law mandates that the entire evidence collection process be recorded by audio-video electronic means using a mobile phone or other electronic devices. This videography requirement adds a layer of transparency and accountability to the process, ensuring that the evidence collected is not only scientifically valid but also visually documented for future scrutiny in court if the need so arises. Using video evidence to verify the chain of custody is a significant step toward improving transparency in the criminal justice process.

SECTION 105: AUDIO-VISUAL DOCUMENTATION OF SEARCH AND SEIZURE

Section 105 is the singularly most significant change in the criminal law set to change the policing practice in the country. As an effort to enhance accountability, Section 105 of the BNSS mandates that all search and seizure proceedings be recorded using audio-video electronic means. This includes preparing lists of seized items to be signed by witnesses. Section 185 provides similar provisions for the recording of a search conducted in the course of an investigation. The relevance of this provision for maintaining the transparency of the evidence-collection process cannot be overemphasized. Furthermore, this provision also enhances the credibility of evidence since such recordings can be used to prove the authenticity of the seizure even if the seizure witnesses turn hostile during the trial.

SECTION 329: GOVERNMENT SCIENTIFIC EXPERTS

Section 293 of CrPC (Code of Criminal Procedure, 1973) provided for notification of Government Scientific experts by the Central Government enabling scientific experts in addition to those enumerated in the section to depute a responsible officer for deposition in the court in their place. Section 329 of BNSS now empowers the state governments also to issue such notifications. However, unlike the specific and measurable criteria in the Scheme for notifying the Examiner of Electronic Evidence

under Section 79A of the Information Technology Act, 2000, no guidelines were provided in CrPC nor have been provided in BNSS for evaluating the forensic experts before issuance of such notification. No guidelines exist for categories of scientific experts already enumerated in the section either. The lack of specific and measurable criteria causes vast differences in the standards of forensic laboratories across the country. Only a few F.S.L.s in India have ISO/NABL accreditations [5].

SECTION 497: DISPOSAL OF PROPERTY

Disposal of seized items can also get questionable on occasions. BNSS Section 497 while enabling quick disposal of seized property, provides stringent requirements such as photography, and if required, videography by the Magistrate of the seized property before ordering their disposal. The visual documentation prepared under this section whether photographs or videos along with the descriptive statement, can be used as evidence in any inquiry, trial, or other proceeding under the BNSS.

THE NEED FOR COMPREHENSIVE EVIDENCE-HANDLING PROVISIONS

Physical evidence, including D.N.A. samples, fingerprints, bloodstains, and ballistic materials, plays an equally important role in investigations, particularly in cases of murder, rape, and other violent crimes. The absence of comprehensive provisions for physical evidence in the BNSS is a missed opportunity. Physical evidence often forms the foundation of criminal investigations and prosecutions. Physical evidence can lose its probative value without proper handling and documentation, weakening the case against a suspect. While the BNSS has made significant strides in addressing the handling of electronic evidence, it is essential that future reforms extend these protections to all categories of physical evidence. By doing so, India can create a more holistic framework for forensic sample integrity, ensuring that all types of forensic materials are handled with the same level of care and scrutiny.

Critical forensic evidence can lose its probative value without a reliable chain of custody, leading to wrongful acquittals or convictions. The lack of faith in the integrity of physical evidence also diminishes public trust in the criminal justice system. It also hinders the investigative process and investigators and prosecutors may be forced to rely on weaker forms of evidence, such as witness testimonies, which can be influenced by bias, memory lapses, or undue influence. Several acquittals in criminal cases in India have illustrated the dire consequences of mishandling physical evidence. In the case of *Prakash Nishad vs. State of Maharashtra*, the accused was acquitted in a rape and murder case by Supreme Court on the grounds, *inter-alia*, of

lack of proper chain of custody⁴⁸. Also, in another murder case ⁴⁹, recovery of offending weapons was held to be inadmissible by Supreme Court as the seized items were not properly sealed during investigation.

GLOBAL BEST PRACTICES: THE STANDARDS FOR FORENSIC EVIDENCE

Countries with advanced forensic systems have embedded rigorous principles into their legal frameworks to ensure that evidence handling is beyond reproach. The American Society for Testing and Materials (ASTM) has developed over 60 standards, including critical guidelines for evidence collection, preservation, and chain of custody in the United States. ASTM standard E1492-11(2017) provides Standard Practice for Receiving, Documenting, Storing, and Retrieving Evidence in a Forensic Science Laboratory. The Organization of Scientific Area Committees (OSAC), led by the National Institute of Standards and Technology (NIST) collaborates with Standards Developing Organizations (S.D.O.s) like the American Academy of Forensic Sciences (AAFS) Standards Board (A.S.B.) to develop standards for forensic practice. A.S.B. has played a vital role in developing standards focused on the reliability of forensic evidence. It is accredited by the American National Standards Institute (ANSI) and its standards are called ANSI/ASB standards. Once ANSI/ASB standards are finalised, OSAC can recommend them for inclusion in the OSAC Registry. This registry is intended to guide forensic laboratories and practitioners on best practices for evidence handling and forensic procedures.

Similarly, in Europe, the European Network of Forensic Science Institutes (ENFSI) ensures that forensic laboratories comply with ISO/IEC 17025 and uphold the highest standards of evidence integrity. Working in collaboration with the European Committee for Standardization (C.E.N.) through CEN/TC 419 Project Committee, ENFSI develops forensic best practice manuals and guidelines that standardise forensic procedures across member countries. These practices ensure that evidence is handled consistently and securely, enhancing the integrity of forensic processes throughout Europe. The U.K. also has robust protocols for forensic practice across different jurisdictions. The United Kingdom has an independent Forensic Regulator, set up in pursuance to the Forensic Science Regulator Act 2021, which has published a Code of Practice and Conduct for forensic science providers and practitioners in the Criminal Justice System. The regulatory body ensures that forensic science services in the U.K. meet high-quality standards, including the integrity of evidence handling, analysis, and reporting. Clause 35 of the Code provides detailed guidance on handling forensic items/exhibits to ensure a chain of integrity and prevent tampering/contamination.

Forensic laboratories in Australia are required to adhere to ISO/IEC 17025 to maintain evidence integrity. Further, recognising the need for comprehensive

⁴⁸ Prakash Nishad @ Kewat @ Kewat Zinak Nishad vs. State of Maharashtra 2023 SCC Online SC 66

⁴⁹ Malaichamy and Anr. vs. State of Tamil Nadu. (2019) 17 Supreme Court Cases 568

standards, the Senior Managers of Australia New Zealand Forensic Laboratories (SMANZFL) and the Australia New Zealand Policing Advisory Agency National Institute of Forensic Science (ANZPAA-NIFS) developed AS5388. This forensic standard covers the entire lifecycle of forensic evidence. Part I of AS5388 deals with the recognition, recording, recovery, transport, and storage of material. From crime scene management to court reporting, this standard ensures that evidence is handled, transported, and analysed with the utmost integrity. It specifically addresses gaps in the collection and continuity of evidence, providing a framework to secure the chain of custody and preserve the integrity of both physical and digital evidence. [6][7][8][9].

ISO/IEC 17025 STANDARDS

ISO/IEC 17025: 2017⁵⁰ is an international standard developed by the International Organization for Standardization (ISO)⁵¹ and the International Electrotechnical Commission (I.E.C.), specifically aimed at testing and calibration laboratories. The standards define the general requirements for the competence of laboratories to carry out testing and calibration activities, ensuring that the results they produce are both accurate and reliable.

- **Quality Management System:** ISO/IEC 17025: 2017 requires laboratories to implement a quality management system similar to ISO 9001, but tailored specifically to the operations of testing and calibration labs. This system must cover all aspects of laboratory operations, including documentation, client feedback, corrective actions, and regular internal audits.
- **Competence of Personnel:** The standard emphasises the importance of having skilled and trained personnel. Laboratories must ensure that testing and calibration staff have the qualifications, training and experience to perform their duties effectively.
- **Method Validation:** Laboratories must use validated methods for testing and calibration which means that the procedures used to produce results are scientifically sound, have been evaluated for accuracy and are consistent with industry best practices.
- **Equipment Calibration and Maintenance:** The standard specifies that all laboratory equipment must be appropriately calibrated and maintained to ensure the reliability of test and calibration results.

⁵⁰ ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories. International Organization for Standardization/International Electrotechnical Committee, Geneva, 2017.

⁵¹ <https://www.iso.org/home.html>

Laboratories are required to maintain records of calibration and maintenance activities.

- **Handling of Test and Calibration Items:** ISO/IEC 17025: 2017 includes detailed provisions for the transportation, receipt, handling, storage, and disposal of test and calibration items to ensure the integrity of the samples throughout the process which is crucial for preventing contamination or loss of integrity.
- **Traceability of Measurements:** The standard requires that measurements be traceable to international or national standards. This means that there must be a clear link between the test or calibration results and reference standards maintained by recognised bodies.
- **Record Keeping and Reporting:** Laboratories must record their testing and calibration activities comprehensively. This includes maintaining accurate and complete records of all test results, calibration activities, and relevant environmental conditions.
- **Continuous Improvement:** The standard encourages laboratories to continuously improve their processes and quality management systems by identifying areas for enhancement and taking corrective actions when necessary.

3.2.1 Several ISO protocols specific to Forensic practice are currently in different stages of approval which include ISO/FDIS 21043.1 Forensic Sciences – Terms, definitions, framework and ISO/FDIS 21043.2 Forensic Sciences – Recognition, recording, recovering, transport and storage of material.

3.2.2 NABL STANDARDS

NABL (National Accreditation Board for Testing and Calibration Laboratories)⁵² is an Indian accreditation body that operates under the Quality Council of India (Q.C.I.) and provides accreditation to laboratories in India for testing, calibration and medical laboratories based on international standards such as ISO/IEC 17025 for testing and calibration laboratories and ISO 15189 for medical laboratories. The National Accreditation Board for Testing and Calibration Laboratories (NABL) document 113: 2008, titled "Specific Criteria for Accreditation of Forensic Science Laboratories," outlines key requirements under the heading of "Evidence Management" to ensure the integrity of forensic evidence. Based on ISO/IEC 17025: 2005, it mandates that each F.S.L. must have a documented system for evidence control to ensure and verify the integrity of physical evidence throughout the forensic process. It also provides that

⁵² <https://nabl-india.org/>

each individual item of evidence must be assigned a unique case designator to ensure clarity and prevent any potential mix-ups during handling and examination.

3.2.3 DIRECTORATE OF FORENSIC SCIENCE (DFSS) QUALITY MANUAL

DFSS, Ministry of Home Affairs, Govt. of India has prepared a Quality Manual based on ISO/IEC 17025:2017. The manual was issued in 2019, however, compliance with the manual has not been mandatory for forensic science laboratories in India. Clause 7.4 provides standards for handling of evidence items, including measures to protect all evidence's integrity and prevent deterioration.

DIGITAL EVIDENCE MANAGEMENT PLATFORMS

Digital platforms are increasingly being adopted across the globe to allow law enforcement agencies, forensic labs and courts to track the movement and condition of evidence in real-time. These platforms provide a centralised system for logging the chain of custody, ensuring that there are no gaps in the record and that the evidence can be accessed only by authorised personnel. In addition to tracking physical and digital evidence, these platforms often include features for securely storing evidence-related data, such as forensic reports, images and video recordings. To enhance traceability, technologies such as RFID (Radio Frequency Identification) tags and barcoding are integrated into these platforms, allowing each piece of evidence to be uniquely tagged and tracked throughout its lifecycle. Blockchain technology can also be integrated with RFID/Barcoding to enhance the security of these platforms. The use of such platforms reduces the chances of human error in documentation and provides an added layer of security against tampering.

The Interoperable Criminal Justice System (ICJS) in India is an initiative to integrate and enhance communication between various pillars of the criminal justice system, including police, courts, prisons, forensic laboratories, and prosecution departments. e-Forensics, under the ICJS project, is an online case registration and tracking system developed. It assists forensic examiners in delivering timely, accurate, and reliable forensic reports to the police and other stakeholders. However, e-forensics, which is meant to exchange forensic examination results, has limited utility in monitoring forensic evidence integrity.

ROADMAP FOR THE FUTURE: STRENGTHENING FORENSIC SAMPLE INTEGRITY IN INDIA

A comprehensive roadmap is essential to address the existing gaps in forensic evidence handling in India and align the forensic protocols with global best practices. This roadmap must not only extend the provisions introduced by the BNSS, 2023 but also introduce reforms that will build a robust system for managing both physical and digital evidence. India can significantly enhance forensic sample integrity by adopting

technological innovations, strengthening infrastructure, building skilled capacity and implementing necessary legislative measures.

LEGISLATIVE AND POLICY MEASURES

To address the gap, the BNSS should incorporate the provisions to include a comprehensive chain of custody requirements for all types of physical evidence. Each step in handling physical evidence from the crime scene to the forensic laboratory to the courtroom, must be documented and the chain of custody should be submitted along with the charge sheet /final report. Section 193 BNSS may be amended accordingly.

Further, section 329 BNSS may be amended to provide a scheme for recognition of F.S.L.s/forensic experts on the lines of the Scheme for notifying the Examiner of Electronic Evidence under Section 79A of the Information Technology Act, 2000. The law should make compliance with standard manuals like the DFSS Quality Manual mandatory for the recognition/accreditation of forensic laboratories. There should be an annual audit of forensic laboratories mandated by law. A specialised law, modeled after the U.K.'s Forensic Science Regulator Act 2021, could also be envisioned to regulate and standardise forensic practices within the country. Such a law should provide a cohesive framework for maintaining quality and integrity in forensic services, enhancing accountability, and promoting adherence to scientifically validated standards.

IMPLEMENTING NATIONAL FORENSIC GUIDELINES

India needs a standardised set of National Forensic Guidelines to ensure consistency in how forensic science is practiced and forensic evidence is handled nationwide. The National Forensic Guidelines should cover all aspects of evidence collection, preservation, and analysis. The guidelines should, *inter alia*, include protocols for crime scene management, proper packaging and transportation of evidence, and the standards that forensic laboratories must meet when processing and analysing evidence. The guidelines should also provide clear instructions on documenting the chain of custody and handling evidence during transfer between law enforcement agencies, forensic labs, and the judiciary. These guidelines should be enforced through regular inspections and audits of forensic laboratories, ensuring they meet national and international standards. Laboratories that fail to comply with these guidelines should be subject to penalties or revocation of their certifications, ensuring the quality and standards of forensic services available in the country.

Though the guidelines would include stipulations regarding infrastructure, capacity building, and standards of forensic examination and opinion, the following aspects should be included in the guidelines concerning the integrity of forensic samples:

CHAIN OF CUSTODY PROTOCOLS

Every stage of evidence handling, from collection to transport, analysis, and storage must be meticulously documented, including details of personnel, date, time, and the condition of the evidence [5]. To ensure traceability and prevent unauthorised access, digital logs using barcodes, RFID systems or other technical solutions may be implemented to track the evidence throughout its entire lifecycle.

TAMPER-PROOF PACKAGING AND SEALING

All evidence must be sealed in tamper-proof containers immediately after collection and any tampered or broken seals must be promptly reported, documented, and investigated. Each evidence container should have a unique identification number linked to a central database, ensuring accountability at every handling stage.

STORAGE AND DISPOSAL

Strict protocols for evidence storage and disposal are required to ensure its integrity and chain of custody. Storage of forensic samples should follow relevant technical specifications regarding the type of container, preservative, and temperature. The retention period for evidence is determined by applicable laws and regulations. Evidence disposal forms must record detailed information, including item numbers, reasons for disposal, date, method of disposal, details of photography/videography, and witness information. A quality assurance protocol for storage and disposal is essential for monitoring compliance and addressing any deficiencies.

VIDEO RECORDING OF EVIDENCE HANDLING

Critical moments, such as the opening of the package, removal of the seal, testing of evidence, and re-packaging/re-sealing, should be video recorded with time and date stamps to ensure transparency and prevent disputes over handling procedures. The footage must be securely stored for a specified period (minimum 02 years), or as required by law or policy framework. Wherever necessary still photographs may also be taken for records.

CCTV SURVEILLANCE

All F.S.L.s and forensic testing facilities should be under CCTV coverage with areas of entry/exit and places of storage under continuous surveillance with at least 6 months of recording facility. Supreme Court has already directed CCTV coverage of all police stations⁵³. Malkhanas (Property rooms) in police stations and courts should be under continuous CCTV surveillance with a storage facility for at least six months.

DIGITAL EVIDENCE PROTECTION

Cryptographic hashing should be used when collecting and at every stage of handling digital evidence to verify its integrity, ensuring that hash values remain consistent to confirm the evidence is unaltered. To prevent tampering, all digital evidence must be encrypted and securely stored, with access restricted to authorised personnel. This should also apply to video recordings and digital output of testing machines.

ISO/IEC STANDARDS

The guidelines, within the legislative and regulatory framework, must provide for mandatory accreditation with ISO/IEC, NABL, or equivalent standards with regular annual audit for forensic protocols to be followed by forensic scientists for collection of samples from crime scene and F.S.L.s for processing and examination of samples. NABL/QCI can also develop India-specific protocols commensurate with global standards in consultation with DFSS.

INDEPENDENT AUDITS AND REVIEWS

Regular independent audits of forensic evidence-handling processes must be conducted to ensure compliance with established protocols. A peer review system should be implemented for forensic reports to identify any potential issues in the chain of custody or evidence analysis. In addition, protocols should be established for regularly auditing the chain of custody, ensuring that any discrepancies are immediately detected and addressed. Such audits provide an additional layer of accountability and help prevent tampering or mishandling of physical evidence.

RIGHT TO THE SECOND EXAMINATION

Both the prosecution and the defence should have the right to request an independent re-examination of forensic evidence at an accredited facility, ensuring fairness and

⁵³ Paramvir Singh Saini v. Baljit Singh, (2021) 1 SCC 184

impartiality within the judicial process. Forensic samples must be stored under appropriate conditions to allow for re-examination, with strict handling protocols in place to safeguard their integrity. Also, provisions should be established for drawing/retaining spare samples for re-testing, particularly in biochemistry, toxicology, and narcotics cases.

ERROR REPORTING AND CORRECTIVE ACTION

Any errors in evidence handling or analysis must be promptly documented and reported including Root Cause Analysis, with corrective action plans implemented to prevent future occurrences. An independent Forensic Integrity Oversight Board or Forensic Ombudsman may be created to oversee error reporting to ensure accountability and maintain the integrity of forensic evidence.

Figure 1 depicts the core elements of a framework to protect the integrity of a forensic sample based on the above discussion:



(Fig 1: Framework for integrity of forensic samples)

CONCLUSION

Ensuring the integrity of forensic samples is not just a technical obligation but a critical component in administering justice. Every piece of forensic evidence, whether digital or physical has the potential to alter the outcome of a criminal case. If the integrity of the forensic chain is compromised, the value of forensic evidence is rendered meaningless. While it may be challenging to create a foolproof system for physical evidence similar to digital security mechanisms like hash values that ensure data integrity, resilient systems are urgently needed to mitigate the risk of tampering, manipulation, or degradation. The New Criminal Laws have made significant progress in ensuring the integrity of digital evidence particularly with the introduction of mandatory filing of chain of custody under Section 193 of BNSS for

electronic devices along with provisions of detailed certifications for secondary digital evidence in B.S.A. These provisions coupled with stringent protocols provided under section 79A of the I.T. Act are significant advancements for India's forensic framework, as it aligns with global best practices.

To build on the progress made by the New Criminal Laws, it is imperative to develop and implement National Forensic Guidelines with provisions for proper handling of all forensic samples, conducting regular audits of forensic labs, and adopting advanced technological solutions to track the chain of custody. A legislative mandate must also be established to standardise forensic practices nationwide. By doing so we can create a more secure and transparent forensic system that upholds the integrity of forensic samples and strengthens the pursuit of justice.

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ANNEXURE 1

****Sequence of Custody Form for Electronic Device****

(Sec. 193(3) (i) of BNSS 2023)

1. Case Detail:

- Police Station: _____
- Case Number: _____ dated _____ u/s _____
- Name of the Investigating Officer: _____
- Contact Number: _____

2. Description of Electronic device:

- Sl Number (as per relevant Column no. of Charge-sheet/Final Report):

- Description of Electronic device: _____
- Type of Device: (e.g., computer, mobile phone, USB drive)

- Make and Model: _____
- Colour: _____
- Serial Number: _____
- Unique Identifiers (if any e.g. IMEI/UIN/UID/MAC/Cloud ID):

- Hash Value (if applicable): _____
- Place of storage of electronic device (if any) at the time of Charge-sheet/Final Report: _____

3. Seizure Details:

- Seized By: _____
- Date and Time of Collection: _____
- Place of Seizure: _____
- Seizure list reference: _____
- Condition of electronic device: (e.g., intact, damaged)

4. Details of Transfers of custody:

5. Final Disposal (if disposed at the time of filing of Charge-sheet/Final Form) :

- Date and Time of Final Disposal:** _____
- Method of Disposal:** (e.g., returned to owner, retained as evidence, destroyed)

- Disposed By:** _____
- Court order ref. (if any)** _____
- Name and signature of receiver (if returned):**

(Name)

(Signature)

6. Additional Notes (if any):

Sl no.	Date of Transfer	Time of Transfer	Transferred From		Received by		Purpose of Transfer	Signature of transferer	Signature of Recipient
			Name	Rank	Name	Rank			

INSTRUCTIONS FOR COMPLETING THE SEQUENCE OF CUSTODY FORM

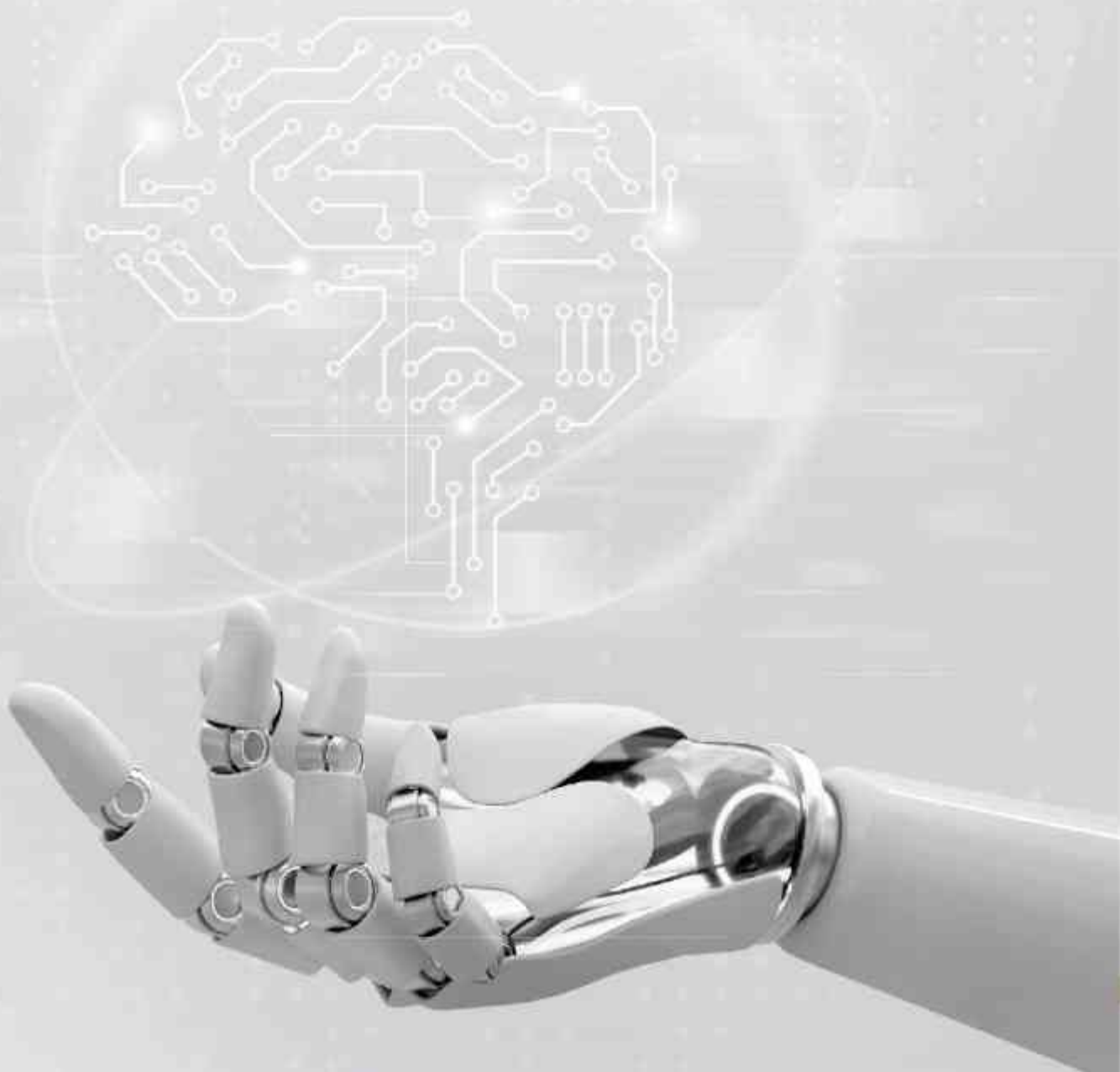
- Use separate forms (in two copies) for each electronic device.
- Fill in all sections accurately at the time of evidence collection and transfer.
- Ensure signatures are obtained from both the transferring and receiving officers/officials involved in the transfer and handling of the evidence.
- The investigating officer should verify the place of storage and the condition of the electronic device at the time of Charge-sheet/Final Report
- Transfer of custody should take place only if necessarily required in the interest of investigation.
- In case of any discrepancies, note them in the Additional Notes section and report to the supervising officer.

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THEME 2:

USING AI AS FORCE MULTIPLIER IN CRIMINAL JUSTICE SYSTEM



PREDICTIVE POLICING FOR CRIME PREVENTION

B Shanker Jaiswal, IPS

Predictive policing is transforming law enforcement by harnessing artificial intelligence (AI) and machine learning (ML) to forecast criminal activities, enabling more effective resource allocation and crime prevention. This article delves into the mechanics, applications, and impact of predictive policing on public safety, while also addressing the accompanying ethical and cybersecurity challenges. With real-world examples from global and Indian contexts, it highlights how predictive policing could revolutionize crime-fighting, despite hurdles like bias and data security concerns.

UNDERSTANDING PREDICTIVE POLICING

Predictive policing is rooted in the application of data analytics to forecast crime hotspots or predict when and where crimes are likely to occur. This modern law enforcement tool analyses historical crime data to identify patterns, trends, and anomalies, which help police deploy resources more effectively. The focus is not on predicting specific criminal actions, but on determining the likelihood of crime in particular areas or by certain individuals.

Predictive policing operates similarly to weather forecasting: it provides probability-based estimates that guide decision-making. The key difference from traditional law enforcement is that predictive policing shifts from being reactive to proactive. By anticipating crime, law enforcement agencies can deter criminal activities before they happen.

The predictive models utilize crime data, neighbourhood characteristics, socio-economic factors, and even real-time data like traffic patterns or social media activity. This dynamic approach makes predictive policing a forward looking tool that is especially useful in urban areas with high crime rates and resource constraints.

THE ROLE OF AI AND MACHINE LEARNING

The evolution of predictive policing has been fuelled by advances in AI and ML. AI technologies, such as deep learning and neural networks, are capable of processing large datasets at incredible speeds, uncovering patterns that are often invisible to human analysts. In India and globally, this technological capability is allowing police forces to make sense of the overwhelming volume of data produced by modern cities.

Machine learning models are particularly suited for predictive policing because they "learn" from data over time, improving their accuracy. For instance, when a model is trained on years of crime data, it can identify trends that repeat seasonally or correlate with specific events, such as festivals or political rallies. These AI models also incorporate real-time data feeds to improve predictions dynamically.

In India, where the police face chronic manpower shortages, AI can enhance productivity by directing officers to areas where their presence is most needed. This technology is not just theoretical; cities like Delhi and Mumbai are already piloting AI-based predictive policing systems to manage crime more efficiently in densely populated urban areas.

THE IMPORTANCE OF DATA AND TECHNOLOGY

We are witnessing a pivotal moment in the intersection of data and technology. The availability of large datasets, enhanced computational power, and sophisticated algorithms has created unprecedented opportunities for police departments to make informed predictions about crime. This convergence enables law enforcement agencies to strategize and deploy personnel more efficiently, significantly improving their ability to prevent crime.

The potential of predictive policing is built on three pillars: data, computing power, and algorithms. Historical crime data provides a foundation for building predictive models, while advanced AI techniques—such as deep learning and convolutional neural networks (CNNs)—enhance the precision of predictions. This synergy between data and technology makes it possible for police departments to make informed decisions about where and when crimes are likely to occur, improving overall public safety.

Data is the backbone of predictive policing. The reliability and accuracy of crime forecasts depend largely on the quality of data input. Traditionally, this data includes crime reports, arrests, and complaints, but modern predictive policing systems integrate additional layers like geographic data, CCTV footage, and even social media analysis.

In India, the police forces' reliance on manual data collection has been a limiting factor. However, the advent of digital tools and initiatives like the Crime and Criminal Tracking Network & Systems (CCTNS) has streamlined data collection and sharing across various jurisdictions. This centralization of data is a significant step towards more robust and reliable predictive models.

Globally, advanced policing systems use big data analytics combined with AI-powered algorithms to generate crime predictions. For instance, the Los Angeles Police Department (LAPD) employs PredPol, an AI system that analyses historical crime data and identifies high-risk areas. The software focuses on small geographical zones, guiding police patrols based on daily predictions.

Similarly, predictive policing models in countries like the UK have been employed to track potential terror threats and gang activities. The integration of AI with law enforcement practices ensures that data is analysed not just for trends but also for deep insights into criminal behaviour.

APPLICATIONS OF PREDICTIVE POLICING

The applications of predictive analytics in policing extend beyond identifying potential crime hotspots. These tools are useful in numerous areas:

1. **Crime Prevention:** Police can focus their efforts on areas with the highest probability of criminal activity. By concentrating patrols and resources, agencies can prevent crimes before they occur.
2. **Operational Planning:** Predictive models assist in planning large-scale operations like raids or controlling public events. For example, during political rallies or religious festivals in India, police can use predictive models to pre-emptively allocate resources to areas where unrest or criminal activity is expected.
3. **Counter-Terrorism:** Predictive policing has proven invaluable in combating terrorism by using behavioural and geographic patterns to identify potential threats. In India, where terrorism remains a significant concern, the ability to predict extremist activities based on historical data can help law enforcement prevent attacks.
4. **Traffic Management and Crime Detection:** Some cities have integrated traffic and crime data to predict where accidents or crimes like robbery may coincide. In India's metropolitan cities, integrating predictive models into Intelligent Traffic Management Systems (ITMS) is proving to be a vital step toward reducing both crime and traffic fatalities.

Predictive policing also holds promise for combating terrorism and gang-related offenses. By analysing patterns in historical data and identifying at-risk individuals or groups, predictive models can guide interventions that prevent these crimes from escalating. This proactive approach has demonstrated its potential in significantly reducing crime rates across various urban centres.

MECHANICS OF PREDICTIVE MODELS

The predictive policing models follow a well structured process involving several stages. First, crime data from multiple sources is gathered, cleansed, and analysed. This data typically includes the location of crimes, times, types of offenses, and socio-economic factors that influence crime rates.

Predictive policing relies heavily on algorithms that analyse historical crime data to identify trends and predict future incidents. These models are trained using crime data spanning several years—typically three to five years—to detect recurring patterns. For instance, in a large city like Delhi, predictions can be made for every day of the year, enhancing the precision and effectiveness of policing efforts.

The process begins with feeding the model historical data, such as crime location, time of occurrence, and social-economic conditions. Once trained, the model can forecast

high-risk areas and suggest locations for increased patrols and law enforcement presence. These models are continually tested and refined, ensuring that they remain accurate and relevant in dynamic urban environments. When law enforcement applies the insights generated by these models, they can prevent crimes before they happen and reduce crime rates significantly.

In practice, law enforcement agencies utilize block diagrams to train their models, test them, and ultimately make predictions. A critical outcome of this process is the identification of crime hotspots—specific areas where certain types of crime are most likely to occur. For example, in a city like Delhi, the model may generate predictions for 1,000 potential crime locations daily, which are distributed across police precincts for targeted patrolling. By focusing on these predicted hotspots, police officers can make better use of limited resources.

In Delhi, for instance, law enforcement agencies have historical data from thousands of reported incidents. Predictive models process this data using AI algorithms to identify crime hotspots and forecast patterns. Police officers receive daily forecasts with maps marking potential crime zones, helping them optimize their patrolling strategies.

The success of these models depends on constant refinement. As more data is input, the system "learns" and adjusts its predictions accordingly. This iterative process ensures that the models stay relevant and accurate even in the face of changing crime dynamics, population shifts, and urban expansion.

GLOBAL AND INDIAN CONTEXT: REAL-WORLD IMPACT

Globally, predictive policing has shown positive outcomes. The previously mentioned trial in Los Angeles, where AI-driven patrol deployments reduced burglary rates by 17%, is a significant case study of its potential impact. Similar successes have been recorded in the UK and several European countries where predictive policing models are integrated into regular law enforcement practices.

In India, where police resources are stretched thin, predictive policing has great potential to increase efficiency. While still in its nascent stages, several Indian states are exploring pilot programs to implement predictive analytics in routine policing. Delhi Police's initiative to use data analytics and AI for crime prevention reflects the broader trend of digital transformation in public safety. The application of these technologies, especially in rapidly growing cities like Bengaluru and Hyderabad, can help mitigate issues stemming from urbanization and crime.

ADDRESSING CYBERSECURITY CONCERNS

Despite its many advantages, predictive policing faces ethical and cybersecurity challenges that cannot be overlooked. One major concern is the vulnerability of predictive models to manipulation by malicious actors. Criminals could potentially

exploit these systems by feeding false data into the models or evading detection through sophisticated countermeasures.

Cybersecurity is paramount in maintaining the integrity of predictive policing systems. In India, the integration of AI in law enforcement makes these systems a target for cybercriminals. Police departments must implement robust encryption methods, secure data storage, and real-time monitoring to prevent breaches that could undermine public trust.

ETHICAL CONSIDERATIONS

While the benefits of predictive policing are clear, ethical concerns must be addressed. The use of AI in law enforcement raises questions about privacy, bias, and accountability. For example, some predictive models have been criticised for reinforcing racial or socio-economic biases present in historical crime data. These biases can lead to over-policing in certain communities, undermining trust between law enforcement and the public.

Ethically, predictive policing raises concerns about bias. Historical crime data often reflects existing socio-economic disparities, leading to the over-policing of marginalized communities. For instance, some models in the U.S. have been criticized for racial bias, as they disproportionately target minority groups based on historical arrest records. In the Indian context, such bias could manifest in geographic or caste-based targeting, necessitating a careful review of algorithms to ensure fairness and transparency.

To safeguard predictive policing models, robust cybersecurity measures are critical. Ensuring the integrity of data, securing algorithms against tampering, and protecting the privacy of individuals are all essential to maintaining public trust in predictive policing technologies. Any breach of these systems could erode confidence and compromise their effectiveness, making cybersecurity a priority for all police departments implementing predictive models.

To ensure that predictive policing is implemented ethically, law enforcement agencies must prioritize transparency and fairness in their algorithms. Policymakers, data scientists, and law enforcement professionals must work together to develop frameworks that mitigate bias, protect individual privacy, and hold law enforcement accountable for how predictive models are used.

INTERDISCIPLINARY NATURE OF PREDICTIVE POLICING

Predictive policing is inherently interdisciplinary, blending elements from criminology, AI, statistics, and sociology. By combining these fields, predictive models gain a holistic view of crime dynamics. Criminology, for instance, provides insights into why certain crimes occur in specific locations, while AI aids in identifying patterns invisible to human analysts.

Traditionally, criminology has focused on understanding criminal behaviour through biological, sociological, and psychological factors. However, recent studies have increasingly recognized the role of environmental factors—such as neighbourhood layout, population density, and economic conditions—in influencing crime rates.

In India, the traditional focus on crime prevention has relied heavily on sociology and psychology, but the integration of AI allows for a more data-driven approach. The interdisciplinary nature of this technology helps law enforcement understand crime from multiple angles, enhancing its ability to address complex challenges such as terrorism, organized crime, and cybercrime.

By integrating insights from criminology and data science, predictive models become more refined and accurate. This multidisciplinary approach enhances the ability of law enforcement agencies to predict criminal activity and take pre-emptive actions. Data mining, machine learning, and deep learning techniques all contribute to the development of these models, ensuring that predictions are based on comprehensive, multi-dimensional analyses.

THE FUTURE OF PREDICTIVE POLICING

Looking forward, the role of AI in law enforcement is only expected to grow. Future predictive policing models will likely incorporate more real-time data sources, including social media monitoring, satellite imagery, and internet-of-things (IoT) devices like smart city sensors.

In India, as smart city projects proliferate, the integration of predictive policing within smart infrastructure will be critical. AI-driven surveillance, combined with IoT and traffic data, could help police respond more quickly to crimes and emergencies, making cities safer. This convergence of technology presents an opportunity for India to leapfrog into the next generation of law enforcement strategies.

However, with this future comes a need for greater oversight. Ensuring that predictive policing is used responsibly and ethically, particularly in diverse societies like India, requires legal frameworks that address privacy concerns and prevent misuse. Collaboration between technologists, law enforcement, and civil society will be key to navigating these challenges.

As technology continues to evolve, so too does the potential of predictive policing. AI and ML are poised to revolutionize law enforcement, shifting the focus from reacting to crimes after they occur to proactively preventing them. By combining predictive analytics with real-time data feeds, such as social media analysis and video surveillance, police agencies will be able to respond more quickly and accurately to emerging threats.

Moreover, ongoing research into AI and ML will further improve the accuracy and reliability of predictive models. As new algorithms are developed, predictive policing

will become more effective at preventing not only street crime but also complex criminal activities like terrorism and organized crime.

CONCLUSION

Predictive policing offers a powerful, data-driven approach to crime prevention, leveraging AI and ML to anticipate criminal behaviour. Its application in both global and Indian contexts highlights the potential for reducing crime rates and improving public safety. However, its success will depend on careful management of ethical concerns, cybersecurity risks, and the equitable application of algorithms.

In conclusion, predictive policing represents a significant advancement in crime prevention strategies, harnessing the power of AI and machine learning to forecast crime and allocate resources more effectively. By leveraging data-driven insights, law enforcement agencies can adopt a proactive approach to public safety, reducing crime rates and improving community well-being.

As the field of predictive policing continues to evolve, its integration into law enforcement practices promises a transformative impact. However, this evolution must be accompanied by a commitment to ethical standards and cybersecurity protections. As technology advances, the collaboration between data scientists, law enforcement professionals, and policymakers will be vital in addressing the challenges and opportunities that predictive policing presents. Predictive policing is not just a technological innovation; it is a societal shift that requires a balance between progress and responsibility.

About the Author

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THEME 3:

ROLE OF POLICE AS FIRST RESPONDER IN DISASTER RISK REDUCTION



INTERPOL PROTOCOL: ROLE OF POLICE IN DISASTER VICTIM IDENTIFICATION (DVI) IN THE CONTEXT OF INDIAN SCENARIO

Hitesh Goyal

It is rarely possible to identify a victim of a major disaster by visual recognition; fingerprints, dental records or DNA samples are often required for a conclusive identification.

- By Interpol Disaster Victim Identification Division

ABSTRACT

Disaster Victim Identification (DVI) is an essential part of responding to and recovering from disasters. The Interpol Protocol is key to ensuring that victims are identified effectively and efficiently. This paper aims to give an overview of the Interpol Protocol, how it is implemented in India, and its effects on disaster response and recovery. It also includes statistics and facts to emphasize the significance of DVI in managing disasters. By examining the current initiatives undertaken by the NDRF and their status, this paper evaluates the impact of police efforts in identifying disaster victims in India.

INTRODUCTION

The Interpol Protocol is a standardized framework for Disaster Victim Identification (DVI) that ensures effective and efficient identification of victims in disasters (OC, D.S. (2010)). The protocol is implemented in India by the National Disaster Response Force (NDRF) in collaboration with state police agencies and forensic experts (Brough, A., Morgan, B., & Rutty, G. (2015)). The protocol has three key components: Identification Process, Data Collection, and Comparison and Verification⁵⁴. It emphasizes the importance of collecting standardized data, including personal identification documents, medical records, dental records, fingerprints, and DNA samples. In India, the Interpol Protocol has been implemented in over 500 DVI operations since 2000, resulting in the identification of over 10,000 victims (Jain, P. 2024). The protocol has

⁵⁴ [Disaster Victim Identification \(DVI\) \(interpol.int\)](https://www.interpol.int/Disaster-Victim-Identification-DVI)

improved efficiency by reducing the timeframe for completing DVI operations by 10-15 days, enhanced accuracy by increasing the accuracy rate by 5-10%, and increased cooperation between agencies (Bikker, J. (2014). The implementation of the Interpol Protocol has also led to improved efficiency, enhanced accuracy, and increased cooperation between agencies. The protocol is recommended to be adopted by law enforcement agencies and disaster management authorities to ensure timely and accurate identification of victims in disasters. The recommendations include providing standardized training to law enforcement agencies and forensic experts on the Interpol Protocol, investing in infrastructure development to support DVI operations, and fostering stronger collaboration between law enforcement agencies, forensic experts, and humanitarian organizations. Also, there is a need of introducing the victimologist in preparing the strategies, standard operating procedures and standard guidelines in the different scenarios of disaster incidents.

BACKGROUND OF THE STUDY

Disasters, including natural calamities, accidents, or terrorist attacks, can lead to significant loss of life and property. Identifying the victims is a crucial task that demands efficient and effective procedures with special skilled efforts. The Interpol Protocol serves as a globally recognized framework for Disaster Victim Identification (DVI). It offers guidelines for police agencies to follow during DVI operations, ensuring that victims are identified swiftly and accurately. The Interpol Protocol was created in partnership with international law enforcement agencies, forensic specialists, and humanitarian organizations. It establishes a standardized approach to DVI, ensuring that victims are identified through a consistent and reliable methodology. The protocol is founded on the three major principles as mentioned in below table:

S. No.	DVI Protocol Principles	Explanation towards Consistent and Reliable Methodology to address the Victims of Disasters.
1.	Standardization	Uniform procedures for collecting, analysing, and comparing data.

2.	Cooperation	Collaboration among law enforcement agencies, forensic experts, and humanitarian organizations.
3.	Accuracy	Ensuring the precision of identification via thorough verification and validation.

Table 1: The Major Principles of DVI Protocol (Official Website of Interpol-DVI Division⁵⁵)

Therefore, based on these three major principles of the DVI protocol, it is further classified in three major key components. The three major components are mentioned in below table:

S. No.	Key Components of DVI Protocol	Further Steps and Importance
1.	Identification Process	The protocol outlines the steps involved in identifying victims, including: 1. Scene assessment and documentation. 2. Body recovery and handling. 3. Data collection (e.g., fingerprints, DNA). 4. Comparison of data. 5. Verification and validation of identities.
2.	Data Collection	The protocol emphasizes the importance of collecting standardized data, including: 1. Personal identification documents (e.g., ID cards, passports). 2. Medical records. 3. Dental records. 4. Fingerprints. 5. DNA samples.
3.	Comparison and Verification	The protocol provides guidelines for comparing data and verifying identities, including:

⁵⁵ [Disaster Victim Identification \(DVI\) \(interpol.int\)](https://www.interpol.int/DVI)

		1. Use of databases (e.g., missing persons, crime scene). 2. Comparison of fingerprints and DNA samples. 3. Verification of identification through multiple sources
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Table 2: Major Key Components of DVI Protocol Process (Source: Interpol DVI Handbook⁵⁶)

The protocol of disaster victim identification gives a holistic approach to dealing with the specific types of disaster incidents. The process and above-mentioned model may be applied to all types of disasters with particular needs.

RESEARCH OBJECTIVES

- [1] To assess the current status of identifying disaster victims according to the Interpol Protocol of DVI within the Indian context.
- [2] To explore the initiatives implemented by NDRF and the role of the police in enhancing the DVI status throughout India.
- [3] To propose policy recommendations for governments aimed at improving the support for disaster victims.

INDIAN SCENARIO

In India, the Interpol Protocol is implemented by the National Disaster Response Force (NDRF) in collaboration with state police agencies and forensic experts. But it is not fully operational in India (Kathane, P., Singh, A., Gaur, J. R., & Krishan, K., 2021). The protocol is used during large-scale disasters, such as floods, earthquakes, and terrorist attacks. The important initiatives and roles undertaken by NDRF and State Police Agencies in India to improve the status of DVI are mentioned in the following table:

S. No.	Breakups of the initiatives undertaken by NDRF ⁵⁷	Breakups of the initiatives undertaken by Police and their role in DVI ⁵⁸	Latest Status
1.	1. <u>Specialized Training</u> : NDRF personnel undergo specialized training in search and rescue operations, medical first response,	• <u>Initial Response and Scene Control</u>: Police are typically the first responders at disaster sites. They secure the	The combined efforts of the NDRF and police greatly enhance the efficiency and

⁵⁶ [DVI DVI Guide 2023.pdf](#)

⁵⁷ <https://ndrf.gov.in/training>

⁵⁸ [DVI DVI Guide Annexure 1.pdf](#)

and DVI techniques. This training ensures they are equipped to effectively manage disaster situations. 2. <u>Deployment of Battalions</u>: NDRF has 16 battalions strategically positioned throughout India to minimize response times during disasters. Each battalion consists of self-contained specialist teams that include engineers, technicians, dog squads, and medical staff. 3. <u>Community Awareness Programs</u>: NDRF organizes community awareness and preparedness programs to inform the public about disaster response and safety measures. 4. <u>Collaboration with International Agencies</u>: NDRF partners with international organizations like INTERPOL to implement best practices in DVI and disaster management.	area, manage crowds, and ensure the safety of both survivors and responders. • <u>Coordination with NDRF</u>: Police collaborate closely with NDRF teams to ensure smooth operations during disasters, providing logistical support and assisting in search and rescue efforts. • <u>Identification and Documentation</u>: Police are crucial in identifying and documenting disaster victims. They gather and manage data, which is vital for DVI processes. • <u>Community Engagement</u>: Police work with local communities to promote awareness about disaster preparedness and response, thereby enhancing overall resilience.	effectiveness of disaster response and victim identification in India. But its not fully functional and operational due to the lack of trainings and skills. A batch of skilled trainers required to implement the DVI protocol in India on large scale. Also, it has been noticed that most of the activities done by NDRF are as per the DVI protocol but effective implementation may increase the more professionalism in this regard (Baryah, N., Krishan, K., & Kanchan, T., 2019).
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Table 3: Initiatives and Roles undertaken by NDRF and State Police Force

India has been participating in INTERPOL's Disaster Victim Identification (DVI) protocols for several years. These protocols are aimed at assisting member countries,

including India, in identifying victims of mass casualty events using techniques like fingerprints, dental records, and DNA samples. By engaging with INTERPOL's DVI services, India can access international support and expertise following significant disasters, which improves the efficiency and accuracy of identifying victims.

IMPORTANT STATISTICS ON DVI OPERATIONS IN INDIA

Data regarding DVI operations done by India is mentioned below table with the impact rate after implementation of Interpol Protocol:

S. No.	DVI Operations in India	Time Frame	Success Rate	Impact
1.	According to the National Disaster Management Authority (NDMA), India has conducted over 500 DVI operations since 2000, resulting in the identification of over 10,000 victims ⁵⁹ .	The average timeframe for completing DVI operations in India is 15-30 days.	The success rate of DVI operations in India is around 80%, with a high accuracy rate of over 90%.	<u>Improved the Efficiency:</u> Reduced the time frame for completing the DVI operation by an average of 10-15 days. <u>Enhanced Accuracy:</u> Increased the accuracy rate of DVI operations by an average of 5-10%. <u>Increased Cooperation:</u> Improved Collaboration between law enforcement agencies, forensic experts, victimologists, and humanitarian organizations.

Table 4: DVI Operations in India, success rate and its impact.

IMPORTANCE OF COOPERATIVE APPROACH IN DISASTER MANAGEMENT

⁵⁹ [International Operations | NDRF - National Disaster Response Force](#)

Many specialized stakeholders are involved in disaster response, making it crucial to acknowledge and appreciate the important roles and responsibilities each one has. Disaster Victim Identification (DVI) is a key part of the overall response, and the success of the operation relies on the effective implementation of suitable plans and structures, with DVI management taking a prominent role within the emergency coordination command framework (Ishwar, T., Malik, P. P., Mohammad, I., Maneel, G., & Chandra, P., 2014).

After a disaster, the uncertainty surrounding the extent of damage, disruption, and the lack of reliable information often makes it difficult to establish an immediate emergency response. However, coordination at all levels—local, regional, national, and international—is vital. While disaster response plans usually outline the necessary coordination mechanisms, these may not be readily accessible right after a disaster (Sehra, V., & Punia, M., 2020). Additionally, such plans are often generic and may not cater to the specific details of each situation.

However, to ensure effective coordination of a disaster response operation, a well-functioning command and organizational structure must be established (Weedn, V. W., 2022). This is especially true for DVI, where various agencies and organizations, each with their own distinct and sometimes conflicting roles and responsibilities, need to work together.

COORDINATION AMONG THE STAKEHOLDERS

After an initial assessment of the disaster site, distinct operational units should be established to handle the response activities. These units need to be easily identifiable and assigned specific roles and responsibilities. The leading authority must also create systems to facilitate effective communication among the operational units, ensuring that vital information is shared with the right people (Miles, A., Muñoz, J. M. P., & Bayle-Sempere, J. T., 2020). In multi-national responses, making early decisions about procedures, language, and the structure of the mission is crucial for improving coordination.

Initially, the specialist response agencies at the disaster site will include *police*, fire, and ambulance services. However, as more resources are brought in, additional specialist services are likely to join and collaborate with Disaster Victim Identification (DVI) teams, including:

S. No.	Specialists Teams/Stakeholders	Agencies and Purposes
1.	Emergency response specialists	Police, Fire, including HAZMAT, Ambulance etc.

2.	Rescue Units	Search and Rescue (Police, NDRF and Paramilitary Forces to be used)
3.	Investigation Unit	Crime and Fire Investigators (Police and Fire Safety Team)
4.	Forensic Services	Scene, Canine Assistance, and Post Blas Examiners (Police and Forensic Teams)
5.	Disaster Investigation Unit	Police and Safety Teams
6.	Intelligence Unit	Police
7.	Public Information Unit	Police and Media

Table 5: Coordination among the Stakeholders responsible for responding the Disaster incidents

The above illustrates a basic example of a multidisciplinary response structure for a disaster incident. Depending on the specifics of the response, local procedures, and the agencies involved, the structure and reporting channels may vary significantly. Nonetheless, this example emphasizes the importance of recognizing that mass casualty events may require collaboration among a wide range of agencies and authorities that DVI disciplines should acknowledge and work alongside.

DEPLOYMENT OF DVI TEAMS IN OPEN AND CLOSED DISASTERS

As per the Interpol Protocol DVI teams may be deployed in following three settings of disasters:

S. No.	Disaster Settings	Explanations regarding deployment of DVI
1.	Open Disasters	These are disasters where the death toll remains unknown. They often involve natural disasters like earthquakes, floods, and wildfires, as well as significant terrorist attacks.
2.	Closed Disasters	These are disasters where it is highly probable that the number of casualties will be quickly determined. Often, these incidents involve situations where there has been prior registration of the individuals involved, such as in the case of train accidents (passenger list).

3.	Combination Open and Closed Disasters	These are disasters that happen when a combination of the previously mentioned events occurs. One example of this is an airplane crashing into a residential area.
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Table 6: Deployment of DVI Teams in Disasters⁶⁰

FOUR PHASES TO IDENTIFICATION OF DISASTER VICTIMS

S. No.	Phases to identify the victims of disaster	Detail
1.	Scene Examination	Depending on the incident, and where it happened, it can take days or even weeks for all the victims and their property to be recovered.
2.	Post Mortem or PM Data	The human remains are examined by specialists to detect as much biometric data as possible. This can include: 1. Fingerprints; 2. Odontology, or dental examination; 3. DNA profiling; 4. Physical indications- tattoos, scars or surgical implants which may be unique to the victim.
3.	Ante-Mortem or AM Data	The next of kin are interviewed about their missing family member to collect information about the person. Biometric data can also be collected as for a PM investigation, mainly fingerprints, DNA, odontological and medical data.
4.	Reconciliation	Once the PM and AM data is collected, a team of specialists compares and reconciles the two sets of information to identify the victims. Identification is only possible if there is a 100% match between AM and PM data on DNA and/or odontological data and/or fingerprints. In addition, other information gathered should not exclude an identification.

Table 7: Phases to the identification of disaster Victims⁶¹

A step-to-step structured guidelines are presented by the DVI protocol to respond any disaster incidents. This may be adopted by the regional agencies of disaster response

⁶⁰ [Disaster Victim Identification \(DVI\) \(interpol.int\)](https://www.interpol.int/Disaster-Victim-Identification-DVI)

⁶¹ [Disaster Victim Identification \(DVI\) \(interpol.int\)](https://www.interpol.int/Disaster-Victim-Identification-DVI)

teams to streamline the standard approach to address the scenes of incidents. Here, as per the requirements of the particular phases, the role of the police increases. As the police are the first responders to any disaster, this may be helpful to them in identifying the victims of the disaster.

CONCLUSION

The Interpol Protocol plays a vital role in ensuring effective and efficient DVI operations during disasters. Its implementation in India has resulted in improved efficiency, enhanced accuracy, and increased cooperation between agencies. Not only the implementation it shall effectively operational in all kinds of disaster incidents. As disasters continue to pose a significant threat to human life and property, it is essential that law enforcement agencies and disaster management authorities adopt standardized protocols like the Interpol Protocol to ensure timely and accurate identification of victims.

The paper also concludes the current Indian scenario of the implementation of the DVI protocol in India. The protocol has been introduced by Interpol for their partner countries to address the incidents but it has not been implemented yet. An operational comprehensive approach is required to streamline the DVI protocol with the existing practices in India. Also, the paper suggests a few recommendations to its stakeholders of Disaster Management Authorities, Government policymakers, and non-governmental agencies to address the issues of disaster incidents in India.

RECOMMENDATIONS

A comprehensive recommendation based on the current scenario of disaster policies in India are as follows:

S. No.	Recommendations	Detail
1.	Standardised Training	Provide standardized training to law enforcement agencies and forensic experts on the Interpol Protocol.
2.	Enhanced Infrastructure	Invest in infrastructure development to support DVI operations, including specialized equipment and facilities.
3.	Inter-Agency Collaboration	Foster stronger collaboration between law enforcement agencies, forensic experts, and humanitarian organizations to ensure effective DVI operations.
4.	Justification	By adopting the Interpol Protocol and implementing it effectively, disaster management

		authorities can ensure that victims are identified quickly and accurately, providing closure to families and communities affected by disasters.
5.	At Pre-Disaster Phase	1. <u>Improve Early Warning Systems</u>: Allocate resources to enhance early warning systems capable of detecting natural disasters like earthquakes, hurricanes, and floods, ensuring timely alerts reach those in affected regions. 2. <u>Perform Regular Risk Assessments</u>: Carry out regular risk assessments to pinpoint high-risk areas and communities, and create focused mitigation strategies to lessen the impact of disasters. 3. <u>Create Emergency Response Plans</u>: Formulate emergency response plans that clearly define roles and responsibilities, outline evacuation procedures, and establish communication protocols for effective disaster response.
6.	During Disaster Response Phase	1. <u>Create a Centralized Coordination System</u>: Set up a centralized system to facilitate effective communication, coordination, and decision-making among government agencies, emergency responders, and other involved parties. 2. <u>Focus on Evacuation and Shelter Needs</u>: Make evacuation and shelter for affected individuals a top priority, particularly for those with disabilities, the elderly, and children. 3. <u>Ensure Access to Emergency Food and Water</u>: Distribute emergency food and water supplies to those impacted to meet their essential needs.
7.	Post-Disaster Phase	1. <u>Offer Psychological Support</u>: Deliver psychological support services to those impacted, including counselling, mental health care, and trauma assistance. 2. <u>Reestablish Essential Services</u>: Quickly restore vital services like healthcare, electricity, water, and communication systems. 3. <u>Aid Small Businesses</u>: Extend support to small businesses through financial aid, loans, and tax

		incentives to facilitate their recovery from the disaster.
8.	Long-Term Recovery Phase	1. <u>Adopt Sustainable Reconstruction Practices:</u> Adopt reconstruction practices that focus on resilience, adaptability, and environmental sustainability. 2. <u>Encourage Community Involvement:</u> Encourage community involvement and participation in the recovery process through public consultations, initiatives led by the community, and organizations based in the community. 3. <u>Offer Assistance to Vulnerable Populations:</u> Offer specialized assistance to vulnerable populations, including women, children, the elderly, and individuals with disabilities.
9.	Technology-Enabled Solutions	1. <u>Create Disaster Response Apps:</u> Design and launch disaster response applications that offer essential information, emergency notifications, and tracking services for those impacted. 2. <u>Utilize Drones in Disaster Situations:</u> Employ drones during disaster scenarios to rapidly evaluate damage, find survivors, and distribute assistance. 3. <u>Establish Digital Identity Systems:</u> Set up digital identity systems to guarantee that those affected receive prompt aid and support.
10.	Inclusive and Equitable Approach	1. <u>Guarantee Equal Access to Assistance:</u> Make sure that all individuals impacted by the situation have equal access to assistance and support, no matter their background or where they are located. 2. <u>Encourage Inclusive Decision-Making:</u> Foster decision-making processes that include the voices of those affected, allowing them to participate in the recovery planning. 3. <u>Tackle Gender-Specific Needs:</u> Focus on the unique needs of women and girls by offering

		specialized support, as they often face greater challenges during disasters.
11.	Budget Allocation	1. <u>Set Adequate Budgets</u>: Set sufficient budgets for disaster response and recovery initiatives. 2. <u>Focus on Long Term Recovery</u>: Focus on long term recovery initiatives rather than just immediate relief efforts. 3. <u>Impose Taxes on Disaster Insurance</u>: Impose taxes on disaster insurance premiums to create extra funding for disaster response and recovery initiatives.

By implementing these policy recommendations, governments can improve their support for disaster victims and reduce the impact of disasters on communities worldwide.

SCOPE FOR FURTHER RESEARCH

The researcher has noticed a few observations while preparing this research paper are mentioned in the following bullet points:

1. No primary data-based research studies are available on the Disaster Victim Identification in India.
2. A comprehensive approach to deal with the disaster is not the solution of all kind of disasters. No, studies available on the use of forensic experts, victimologists and police sensitizations in the DVI.

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POLICING EFFORTS IN DISASTER RISK REDUCTION: INTEGRATING GIS AND AI-ML FOR ENHANCED RESPONSE AND MANAGEMENT

Viveka Kumar, Vinay Aseri

ABSTRACT

This comprehensive review examines the evolving role of law enforcement in disaster risk reduction (DRR) and explores the integration of Geographic Information Systems (GIS) and Artificial Intelligence/Machine Learning (AI-ML) technologies to enhance policing efforts during disasters. The paper discusses traditional police functions during disasters, such as search and rescue operations and maintaining law and order, while also delving into emerging technologies that are transforming disaster management practices.

The paper also addresses challenges, ethical considerations, and future trends, emphasizing the need for cross-sector collaboration, training, and policy development to ensure effective and equitable disaster management. Through case studies from various international contexts, the paper illustrates the benefits of these technologies in enhancing police led disaster management. It also addresses the challenges posed by data security, ethical considerations, and technical limitations. The paper concludes by offering future recommendations for police training, cross-sector collaboration, and policy development, emphasizing the critical need for technological advancements in policing to mitigate disaster risks effectively.

This research contributes to the growing body of literature on the intersection of technology and disaster management, offering insights into how modern policing can leverage cutting-edge tools to save lives and mitigate the impacts of natural disasters.

INTRODUCTION

OVERVIEW OF DISASTER RISK REDUCTION (DRR) AND ITS SIGNIFICANCE

Disaster Risk Reduction (DRR) has become increasingly crucial in today's world, given the rising frequency and severity of natural disasters. The importance of DRR cannot be overstated, as it plays a critical role in saving lives, protecting infrastructure, and mitigating the socio-economic impacts of disasters. Disaster Risk Reduction (DRR) encompasses a set of strategies and practices aimed at minimizing the vulnerabilities and risks posed by natural and man-made disasters. Its significance lies in its proactive approach to disaster management, focusing on preparedness, mitigation, and long-term resilience rather than just reactive response efforts.

ROLE OF LAW ENFORCEMENT IN DRR

Law enforcement plays a crucial role in DRR by maintaining public order, assisting in evacuations, facilitating search and rescue operations, and coordinating with other emergency services. Their presence during disaster events ensures community safety and prevents opportunistic crimes, contributing to a more organized and effective disaster response.

IMPORTANCE OF INTEGRATING ADVANCED TECHNOLOGIES (GIS, AI-ML) IN POLICING FOR DISASTER RESPONSE

Recent advancements in Geographic Information Systems (GIS) and Artificial Intelligence/Machine Learning (AI-ML) technologies have opened up new possibilities for enhancing policing efforts in disaster risk reduction. GIS allows for real-time situational awareness by mapping disaster-prone areas and monitoring events as they unfold. AI-ML, on the other hand, enables predictive policing, estimating the extent and intensity of disasters, designing recovery processes, resource allocation, and decision-making support, helping law enforcement to act swiftly and efficiently in dynamic disaster environments.

OBJECTIVES OF THE REVIEW

This paper aims to explore the evolving role of law enforcement in disaster risk reduction, with a focus on the integration of GIS and AI-ML technologies. Specifically, the objectives of this review are:

- To examine the traditional roles of police in disaster scenarios and their evolution in the face of emerging technologies.
- To discuss the significance and applications of GIS in enhancing policing efforts during disasters.
- To explore the potential of AI and ML in predictive policing and disaster management.
- To address the challenges and ethical considerations associated with the adoption of advanced technologies in disaster policing.
- To outline future trends and recommendations for policymakers and law enforcement agencies in integrating GIS and AI-ML technologies into disaster risk reduction strategies.

POLICING IN DISASTER RISK REDUCTION

Law enforcement agencies have played crucial roles in disaster scenarios, providing critical support during both the preparedness and response phases of disaster management. Traditionally, police functions during disasters have revolved around ensuring public safety, assisting affected communities, and preventing criminal activities.

TRADITIONAL ROLES OF POLICE DURING DISASTERS

Traditionally, law enforcement agencies have played crucial roles in disaster scenarios, focusing primarily on three key areas:

1. **Search and Rescue Operations:** Police forces often participate in search and rescue efforts, utilizing their resources and personnel to locate missing individuals and assist in evacuation processes.
2. **Maintaining Law and Order:** As seen in the aftermath of Hurricane Katrina, maintaining law and order becomes a critical function for police during disasters. The breakdown of social structures and the overwhelming of local authorities can lead to chaos and criminal activity, necessitating a strong police presence.

EVOLUTION OF POLICE FUNCTIONS IN DISASTER MANAGEMENT

Today, law enforcement agencies are tasked with more strategic roles in disaster preparedness and response, including disaster risk assessment, emergency planning, and resource management. Modern policing increasingly involves using data, geographic information systems (GIS), and predictive analytics to anticipate disaster impacts and respond more effectively. This evolution has been characterized by:

- **Enhanced technological capabilities:** The integration of advanced technologies, such as GIS and AI-ML, has enabled police to improve situational awareness, enhance decision-making, and optimize resource allocation.
- **Specialized units:** Many police departments have established specialized disaster response units, equipped with specialized training and equipment to handle various types of disasters effectively.

CASE STUDIES: EXAMPLES OF SUCCESSFUL POLICE INTERVENTIONS IN DRR

- **Hurricane Katrina (2005):** In the aftermath of Hurricane Katrina, law enforcement played a critical role in maintaining order during one of the most catastrophic natural disasters in U.S. history. Police forces were instrumental in organizing evacuations, conducting search and rescue missions, and preventing widespread looting in New Orleans, despite the immense strain on their resources. The coordination between local, state, and federal law enforcement agencies highlighted the importance of joint operations in disaster response.
- **Indian Ocean Tsunami (2004):** Following the Indian Ocean tsunami, police in several affected countries, including Indonesia and Thailand, were at the forefront of search and rescue operations. Their efforts were critical in locating survivors and providing immediate relief to displaced populations. In addition

to rescue operations, police were responsible for maintaining order in regions devastated by the tsunami, preventing potential conflicts over scarce resources, and managing the influx of international aid workers.

TECHNOLOGICAL ADVANCEMENTS IN DISASTER POLICING

As disasters grow in complexity due to factors such as climate change and urbanization, there is a pressing need for more advanced tools and methods to enhance disaster management. In recent years, technological advancements, particularly in Geographic Information Systems (GIS) and Artificial Intelligence-Machine Learning (AI-ML), have revolutionized disaster policing.

OVERVIEW OF EMERGING TECHNOLOGIES IN DISASTER MANAGEMENT

The landscape of disaster management has undergone significant transformations with the advent of advanced technologies. Four prominent areas of technological advancement that are revolutionizing disaster policing are Geographic Information Systems (GIS), Drones and Robotics- Offering crucial aerial views of affected areas, assisting in search and rescue operations, Internet of Things (IoT) - IoT sensors deployed in smart cities or disaster-prone regions collect real-time data on environmental changes, infrastructure integrity, and human activity and Artificial Intelligence/Machine Learning (AI-ML).

SIGNIFICANCE OF GIS (GEOGRAPHIC INFORMATION SYSTEMS) IN DISASTER POLICING

GIS technology has proven invaluable in enhancing policing efforts during disasters:

- **Enhanced Situational Awareness:** GIS allows law enforcement agencies to create real-time maps of disaster-affected areas, providing critical situational awareness during emergency situations.
- **Predictive Mapping:** By analysing historical data and environmental factors, GIS can identify potential disaster-prone areas, enabling pre-emptive policing strategies.
- **Resource Allocation Optimization:** GIS helps in efficient allocation of resources by visualizing the distribution of emergency services and affected populations.
- **Real-Time Monitoring:** GIS enables real-time tracking of disaster progression and response efforts, facilitating data-driven decision-making.
- **Crowd Control and Traffic Management:** GIS-based applications can track population movements and monitor areas where crowds are likely to form during evacuation or relief efforts. Police can use this data to manage traffic flow.
- **Search and Rescue Operations:** In large-scale disasters, GIS helps police pinpoint the locations of trapped or displaced individuals. By integrating satellite imagery

and aerial data, GIS allows for precise navigation and rescue operations in remote or heavily damaged areas.

ROLE OF AI AND MACHINE LEARNING IN PREDICTIVE POLICING AND DISASTER RESPONSE

AI and ML technologies are increasingly being integrated into disaster management processes, offering several advantages:

1. **Improved Forecasting:** AI algorithms enhance forecasting capabilities, allowing for earlier warnings and better preparedness.
2. **Predictive Analytics:** By analysing large datasets, ML techniques can predict potential disaster hotspots and anticipate criminal activity during disasters.
3. **Optimized Resource Distribution:** AI systems can analyse various factors to optimize resource allocation during disaster responses.
4. **Enhanced Decision-Making:** AI-assisted analysis of comprehensive datasets supports informed decision-making in high-pressure disaster scenarios.
5. **Climate Change Adaptation:** ML algorithms contribute to climate science explorations, bolstering adaptation and mitigation strategies.

INTEGRATING GIS FOR DISASTER RISK REDUCTION

Geographic Information Systems (GIS) have become an indispensable tool in disaster risk reduction (DRR), especially in enhancing the capacity of law enforcement to anticipate, manage, and respond to disasters. GIS allows police forces to make more informed decisions, improving overall situational awareness and strategic planning.

HOW GIS ENHANCES SITUATIONAL AWARENESS FOR POLICE

Geographic Information Systems (GIS) play a crucial role in enhancing situational awareness for law enforcement agencies during disaster scenarios:

- **Real-time Mapping:** GIS allows police forces to create dynamic maps of affected areas, providing up-to-date information on the extent and severity of disasters.
- **Resource Visualization:** By overlaying resource locations on disaster maps, GIS helps police visualize the distribution of emergency services relative to affected populations.
- **Data Integration:** GIS enables the integration of various data sources, including satellite imagery, sensor data, and field reports, providing a comprehensive view of the disaster situation.

MAPPING DISASTER-PRONE AREAS FOR PRE-EMPTIVE POLICING STRATEGIES

One of the most powerful uses of GIS is the ability to map disaster-prone areas and develop pre-emptive policing strategies to mitigate risks before a disaster occurs. This includes:

1. **Identifying High-Risk Zones:** GIS can analyse historical data on natural disasters, such as earthquakes, floods, or wildfires, to highlight areas that are most vulnerable. Police can use these maps to create disaster preparedness plans.
2. **Pre-Evacuation Planning:** With GIS, police can design and test evacuation routes before a disaster strikes. These routes can be tailored to specific communities based on population density, road networks, and geographical obstacles.
3. **Targeted Community Outreach:** By mapping vulnerable areas, law enforcement can engage in pre-emptive public education campaigns, advising communities on how to prepare for specific disaster risks.
4. **Disaster Drills and Simulations:** GIS allows police to simulate disaster scenarios, which can be used for training and preparedness exercises. These simulations help law enforcement practice responding to various disaster events and refine their strategies based on realistic data.

EXAMPLES OF GIS APPLICATIONS IN REAL-TIME DISASTER MONITORING

GIS technology has been successfully applied in various disaster scenarios to enhance response efforts. For instance, during hurricanes, GIS can track storm trajectories and predict flood zones, allowing for targeted evacuations and resource allocation. In wildfire management, GIS helps monitor fire spread patterns and identify optimal evacuation routes. Earthquake response efforts benefit from GIS-generated maps showing damage zones and population density, aiding in prioritizing rescue efforts. Additionally, GIS enables the creation of flood inundation models, allowing authorities to anticipate areas likely to be affected during heavy rainfall events. These applications demonstrate how GIS can significantly improve situational awareness and decision-making during disasters.

CHALLENGES AND LIMITATIONS OF GIS IN POLICING EFFORTS

While GIS technology offers significant benefits, several challenges must be addressed:

1. **Data Quality and Availability:** The effectiveness of GIS depends on access to accurate, up-to-date data, which may not always be available in disaster scenarios.

2. **Technical Expertise:** Police departments require specialized training to effectively utilize GIS tools during high-pressure emergency situations.
3. **Infrastructure Resilience:** GIS systems themselves may be vulnerable to infrastructure disruptions during disasters, potentially limiting their availability when needed most.
4. **Privacy Concerns:** The collection and use of geospatial data raise privacy concerns, particularly in sensitive areas such as evacuation routes and shelter locations.

Despite these challenges, the benefits of GIS in enhancing disaster response efforts make it an essential tool for modern policing. With ongoing advancements in GIS technology and increased training for law enforcement personnel, these limitations can be addressed.

AI AND MACHINE LEARNING FOR DISASTER MANAGEMENT

The integration of Artificial Intelligence (AI) and Machine Learning (ML) in disaster management has significantly improved the ability of law enforcement agencies to respond efficiently and proactively during crises.

PREDICTIVE POLICING USING AI-ML TO ANTICIPATE CRIME DURING DISASTERS

Disasters often create opportunities for criminal activity, such as looting, vandalism, or price gouging, as law enforcement resources are stretched thin and social systems are disrupted. AI and machine learning algorithms can analyse historical data and identify patterns that may indicate potential future emergencies or criminal activities during disasters. By recognizing these patterns, law enforcement agencies can implement preventive measures and allocate resources more effectively, reducing the likelihood of certain types of crimes occurring during disaster scenarios.

AI-ML ALGORITHMS IN CROWD MANAGEMENT, RESOURCE ALLOCATION, AND DISASTER PREDICTION

Crowd Management: During disasters, large crowds often gather at evacuation points, relief centers, or aid distribution areas, which can lead to safety concerns. AI-ML algorithms can analyse data from cameras, drones, and social media feeds to predict crowd movements, identify congestion points, and assess crowd behaviour. AI-ML can estimate the density of crowds in real time, enabling law enforcement to prevent overcrowding, manage foot traffic, and ensure public safety.

Resource Allocation: AI-ML enhances the allocation of vital resources such as food, water, medical supplies, and personnel by predicting demand and prioritizing areas with the greatest need. AI can predict resource needs based on factors like population

density, disaster severity, and infrastructure damage, allowing law enforcement to prioritize high-risk areas.

Disaster Prediction: AI-ML algorithms are crucial for predicting natural disasters such as floods, earthquakes, and storms, allowing law enforcement to prepare and respond more effectively.

1. **Flood Prediction Models:** AI-ML models can analyse weather patterns, river levels, and terrain data to predict floods and provide early warnings.
2. **Earthquake Prediction:** While predicting the exact time and location of earthquakes remains difficult, AI-ML can analyse seismic data to detect patterns that may indicate an impending event, helping law enforcement pre-position resources and issue alerts.

MACHINE LEARNING MODELS FOR EMERGENCY COMMUNICATION AND COORDINATION

Machine learning algorithms can analyse vast amounts of historical data from past emergency calls, helping identify trends and patterns that inform future responses. This predictive capability allows dispatch centers to allocate resources more effectively and prepare for high-demand periods, enhancing overall response effectiveness. AI-ML can be used to develop intelligent communication systems that can automatically route emergency calls, prioritize incidents, and optimize communication channels.

AI-ML IN REAL-TIME DECISION-MAKING DURING DISASTER RESPONSE

During large-scale events like natural disasters, AI can predict areas with the highest need for medical supplies and personnel, allowing for strategic pre-positioning of resources. This real-time analysis and decision-making capability significantly enhance the efficiency and effectiveness of disaster response efforts. AI-ML models can also continuously analyse new data to provide a real time risk assessment of the evolving disaster. For instance, during a hurricane, AI-ML models can evaluate changes in wind speed, storm trajectory, and population movements to adjust police response strategies.

CASE STUDIES AND BEST PRACTICES

ANALYSIS OF GIS AND AI-ML IN POLICE-LED DISASTER MANAGEMENT

Two notable case studies demonstrate the effectiveness of GIS and AI-ML technologies in disaster management:

1. Japan's Earthquake Early Warning System:

1. Utilizes real-time seismic data analysis to predict earthquake impacts within seconds.

2. Provides critical information to emergency responders and the public through mobile apps and public address systems.
3. Has reduced casualties and damage from earthquakes since its implementation.

2. AI-driven Flood Management in the US:

1. Employs machine learning models to analyse historical flood data and predict high-risk areas.
2. Enables proactive resource allocation and evacuation planning before floods occur.
3. Helps optimize emergency response efforts by identifying most vulnerable communities.

INTERNATIONAL EXAMPLES OF TECHNOLOGY-ENABLED POLICING FOR DISASTER MANAGEMENT

1. India's Cyclone Management System

India faces frequent cyclones along its coastline, and in recent years, the country has integrated GIS and AI-ML technologies into its disaster management framework to enhance police-led responses.

1. AI-ML for Cyclone Prediction: India's meteorological agencies use AI-ML models to predict cyclone trajectories, wind speeds, and potential damage areas. Police forces use this information to pre-position emergency teams and guide community evacuations.
2. GIS for Damage Assessment and Response: After the landfall of a cyclone, law enforcement agencies use GIS to map areas affected by storm surges, high winds, and flooding. During Cyclone Fani (2019), GIS helped authorities track the cyclone's impact, enabling timely response efforts.

2. AI-Powered Earthquake Response in Chile

Chile, located along the Pacific Ring of Fire, is highly susceptible to earthquakes. In response, the country has adopted AI-ML and GIS to improve earthquake preparedness and response.

- AI-ML for Earthquake Risk Assessment: Chile uses AI-ML algorithms to analyse seismic data and predict the likelihood of aftershocks. This predictive capability helps law enforcement plan recovery efforts and prepare for additional tremors.
- GIS for Coordinated Response: Police and emergency services use GIS to coordinate their response in the aftermath of earthquakes.

3. AI-Driven Disaster Management in Singapore

Singapore, known for its advanced technology infrastructure, has implemented AI-ML and GIS in disaster management, focusing on urban floods and public safety.

1. **Smart Nation Initiative:** As part of its “Smart Nation” initiative, Singapore integrates AI-ML with IoT sensors and GIS to predict urban flooding, manage traffic, and enhance emergency services.
2. **Crowd Management During Public Events:** Singapore's law enforcement agencies use AI-ML algorithms for crowd management during large-scale events, such as the annual National Day Parade. AI analyses foot traffic and social media data to predict crowd movements and potential bottlenecks.

CHALLENGES AND ETHICAL CONSIDERATIONS

While Geographic Information Systems (GIS) and Artificial Intelligence-Machine Learning (AI-ML) offer significant advancements in disaster policing, their deployment also presents several challenges and raises critical ethical concerns.

DATA PRIVACY AND SECURITY CONCERNS WITH AI-ML AND GIS IN DISASTER POLICING

The use of GIS and AI-ML in disaster policing raises significant data privacy and security concerns. Collecting and analysing large amounts of data, including personal information, can pose risks to an individual's privacy. Additionally, there is a risk of data breaches and unauthorized access, which could compromise sensitive information. In disaster situations, sensitive personal data might be shared across agencies without proper oversight or safeguards. This can increase the risk of data breaches, identity theft, and unauthorized access by malicious actors.

The systems used for disaster management collect sensitive data on infrastructure, public safety, and law enforcement operations, making them attractive targets for cyberattacks. Inadequate cybersecurity protocols in GIS and AI-ML systems could lead to data breaches, denial-of-service attacks, or malicious manipulation of emergency response systems. For instance, an attack on GIS infrastructure during a disaster could lead to the dissemination of false information, hindering law enforcement's ability to manage the situation.

TECHNICAL CHALLENGES IN DEPLOYING GIS AND AI-ML SYSTEMS

Despite their potential benefits, several technical challenges hinder the widespread adoption of GIS and AI-ML systems in disaster policing:

1. **Data Availability and Quality:** The effectiveness of GIS and AI-ML systems in disaster management depends on the availability and quality of real-time data.

However, in many regions, especially in developing countries, data infrastructure may be limited or outdated.

2. **Data Standardisation Issues:** Disaster management involves multiple agencies, each with its data collection methods. The lack of standardised data formats across these agencies can hinder the integration and analysis of data in real-time GIS and AI-ML systems.
3. **Infrastructure and Connectivity:** Many regions affected by disasters may lack the necessary infrastructure to support advanced technologies like GIS and AI-ML.
4. **Limited Network Access:** Disasters often disrupt communication networks, making it difficult for law enforcement to access real-time data from GIS and AI systems.
5. **Hardware and Software Limitations:** Some law enforcement agencies may lack the hardware (e.g., servers, GPS devices) and software capabilities (e.g., AI algorithms, GIS applications) necessary to run advanced predictive systems.

ETHICAL IMPLICATIONS OF PREDICTIVE POLICING IN VULNERABLE COMMUNITIES

The use of predictive policing, which relies on AI-ML algorithms to anticipate crime, raises ethical concerns, particularly in vulnerable communities. There is a risk of biased algorithms that disproportionately target marginalized groups, leading to discriminatory policing practices. Also, Over-reliance on AI predictions could further erode already fragile trust between law enforcement and vulnerable communities.

During disasters, AI-ML models may predict higher crime rates or civil unrest in certain areas based on demographic or socioeconomic factors, prompting law enforcement to deploy preventive measures. This deployment of predictive policing technologies in disaster situations could fuel social tensions if certain communities feel they are being unfairly monitored or discriminated against.

FUTURE TRENDS AND RECOMMENDATIONS

This section explores future trends, the importance of cross-sector collaboration, training needs, and policy recommendations to better prepare police forces for the challenges ahead.

FUTURE OF POLICING IN DISASTER RISK REDUCTION WITH ADVANCED TECHNOLOGIES

- **Increased Use of AI-ML for Predictive Disaster Policing:** AI-ML models will continue to advance, providing more accurate predictions of natural

- disasters and their impacts. Predictive policing will extend beyond crime forecasting to encompass disaster forecasting.
- **Predicting Human Behaviour During Disasters:** AI-ML could be used to analyse patterns of human behaviour during disasters, helping police anticipate crowd movements, potential panic, or criminal activity.
 - **3D and Real-Time GIS Mapping:** Future GIS systems will incorporate 3D mapping technologies and live data feeds to provide highly detailed situational analysis.
 - **Mobile GIS Applications for Field Officers:** Mobile versions of GIS systems will become standard tools for police officers in the field, providing real time location-based data directly on handheld devices.
 - **AI-Driven Resource Management and Disaster Response:** AI-ML will be used to optimize resource allocation, ensuring that law enforcement agencies have the necessary personnel, equipment, and logistics in place to respond to disasters more efficiently.
 - **Real-Time Sensor Data:** IoT sensors embedded in smart cities will provide police with continuous updates on environmental conditions, including water levels, air quality, and structural integrity of buildings, which will help in disaster prevention and response.
 - **Autonomous Drones and Robots:** Police forces will adopt AI-driven drones and robotic systems to enhance situational awareness, conduct search and rescue missions, and provide real time data during disasters. These tools will be invaluable in areas that are too dangerous or inaccessible for human officers.

CROSS-SECTOR COLLABORATIONS BETWEEN POLICE, TECHNOLOGY FIRMS, AND DISASTER MANAGEMENT AGENCIES

To fully realize the potential of GIS and AI-ML in disaster policing, it is essential to foster cross sector collaborations between law enforcement agencies, technology firms, and disaster management agencies. These collaborations can facilitate knowledge sharing, resource sharing, and the development of innovative solutions.

Police forces will increasingly work with tech firms to co-develop AI-ML algorithms, GIS applications, and disaster response tools that address real-world challenges faced by law enforcement in disaster situations.

Tech companies specializing in AI-ML, GIS, and IoT can offer law enforcement access to the latest technological innovations and data analytics tools. This collaboration will enable police to leverage cutting-edge technology without the need for in-house expertise in every area.

TRAINING POLICE PROFESSIONALS IN GIS AND AI-ML TECHNIQUES

To effectively utilize GIS and AI-ML, police professionals must receive adequate training, and comprehensive curriculum development covering both theoretical foundations and practical applications of GIS and AI-ML in policing is essential. Ongoing professional development through regular workshops and certification programs can keep officers updated with the latest technological advancements. This training should be tailored to address specific challenges faced by law enforcement agencies, such as data privacy concerns and ethical considerations in AI-driven decision-making.

In addition to technical skills, police will need to develop collaborative skills to work effectively with disaster management professionals, data scientists, and tech specialists during disaster operations.

POLICY RECOMMENDATIONS FOR GOVERNMENTS AND LAW ENFORCEMENT AGENCIES

To ensure the effective integration of advanced technologies in disaster policing, governments and law enforcement agencies should consider the following recommendations:

1. Develop clear guidelines for the use of AI and ML in policing, addressing issues of transparency and accountability.
2. Invest in robust cybersecurity measures to protect sensitive data and prevent unauthorized access to emergency systems.
3. Establish independent oversight bodies to monitor the use of advanced technologies in policing and ensure they are used ethically and effectively.
4. Conduct regular audits and assessments of current systems to identify areas for improvement and potential risks.
5. Foster open dialogue with civil society organizations to address concerns and ensure public trust in technology-enhanced policing efforts.

CONCLUSION

This review has examined the critical role of law enforcement in disaster risk reduction and the potential of integrating geographic information systems (GIS) and artificial intelligence/machine learning (AI-ML) to enhance disaster response and management.

Key insights from the paper include the traditional roles of police in disaster scenarios—such as search and rescue, maintaining order, and coordinating with emergency services—and the evolution of these roles as advanced technologies enable more efficient and predictive disaster response. Case studies of successful police interventions demonstrate the effectiveness of integrating technology into disaster management, offering valuable lessons for future applications.

The integration of GIS and AI-ML in police disaster management is not merely beneficial but essential for enhancing situational awareness, improving resource allocation, and enabling real-time decision-making. As these technologies continue to evolve, they will allow police to anticipate disasters, predict human behaviour, and ensure timely responses that save lives and property.

In future disaster scenarios, the role of police will expand beyond traditional law enforcement duties to include predictive policing, real-time data analysis, and cross-agency coordination, all powered by advanced technologies. Policymakers and law enforcement agencies must invest in these technologies and provide adequate training to ensure police are equipped to respond effectively to increasingly complex disaster challenges. Ultimately, technological integration will not only improve disaster management but also position police forces as central actors in future disaster preparedness and response.

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ROLE OF POLICE AS A FIRST RESPONDER IN POST RAILWAY ACCIDENT SITUATION

Aditya Kumar, Shyam Yadav, Vishwa Gorasiya, Subhajit Bandopadhyay

ABSTRACT

The purpose of the paper is to enhance the role of relations multidisciplinary aspects, one of the highly required areas is train accidents which can result in catastrophic consequences, hazards material spills, public-police relations, and ongoing issues. As a first responder, police always try to keep their duty abiding by law and order. The various forces related to the Indian railway incessantly work on various disasters and related problem-solving areas.

The various operational aspects such as Overcrowding, Operational error, aging infrastructure, Poor track maintenance, and Climate change, Play a significant role in the train accident.

INTRODUCTION

The first responder, the police always tries to cover a broad range of ideas like rescue operations, help the public in the best supportive way, and control emerging crime in the public domain. In the domain of disaster, all public authorities are equally responsible for tackling the situation. But we focus on that person who is the most visualized individual in society i.e. police.

Indian railway in combination with the police put one step forward to tackle every problem in its best possible way, they always prepare for all unforeseen circumstances, loss of public life, destruction of infrastructure, and all other aspects.

CURRENT SCENARIO

Nowadays, a major problem arises in society i.e. Train Accident, while it's relatively rare before 10 years. In last 8 years the number of accidents has been increased drastically (Figure 1). There should be a legal framework cited before every action. In this paper, there are some implementer ideas and some guidelines to be followed by the police.

This is mainly based on case studies, observation, investigation process, immediate police response, and community/public-police relations. Some scholarly articles give a brief idea to prepare the paper.

METHODOLOGY

The analysis of various railway accidents is based on case studies and empirical data from the Right to Information Act 2005, officers of the Central Railway Department, the National Disaster Management Authority, and all authenticated sources available on the internet. It is probably used to decide cause and effect, behind-the-scenes, post-disaster material requirements, and suggestions to improve related problems. The approach to collect responses from the public should be followed by a normative pattern e.g. Observation, interview, questionnaires, etc. This formative analysis is a step method followed by Observation, Special Cases, Reason, behind-the-scenes, etc.

OBSERVATION

In India various authorities are working at various levels such as at the NDMA, SDMA and DDMA to tackle every unforeseen circumstance. Apart from the ODRAF team police forces also going through the same condition.

We see many train accidents occurring in nearby slum areas. They covered closely railway tracks and due to lack of money, purity vanished. They stole some part of the railway track itself to fulfill their daily needs and children living in nearby areas unconsciously come to the track and youngsters face the same because of addiction to social media or plugged-in earphones. So, police must keep an eye on these things.

Many other aspects like overcrowding beyond ability, properly equipped instruments & other physical features can be controlled by the Police.

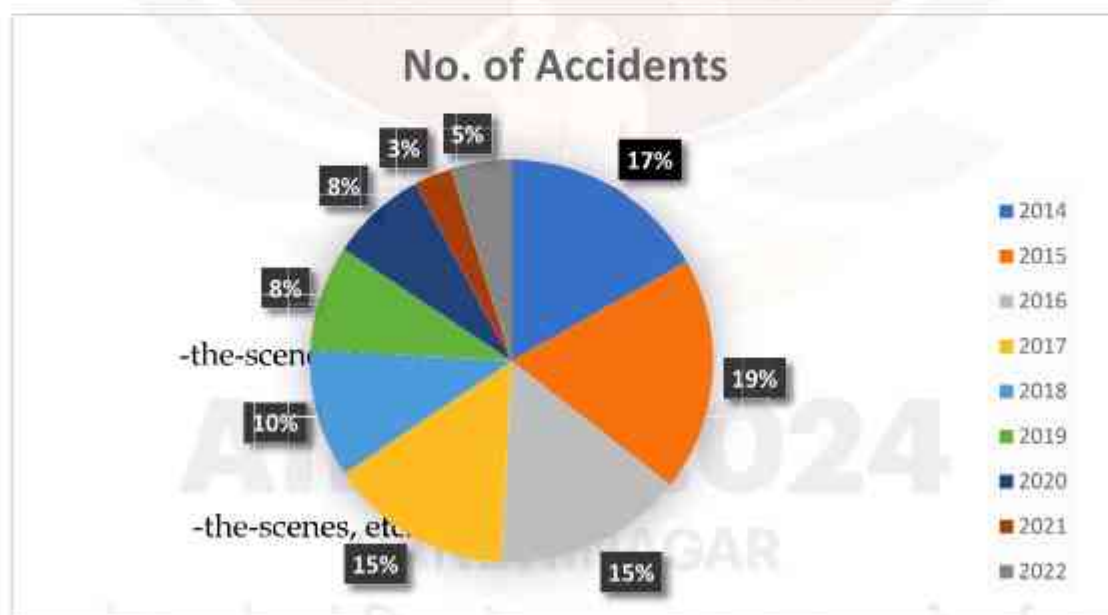


Figure 1: Number of accident in last 8 years (FY 2014 - FY 2022) (Source- Statista.com)

Analysis: - Many people depend on the Indian railways every day for transportation, making it one of the biggest railway networks in the world. Data show a sharp

decrease in the number of derailments, which account for most accidents, over the past 20 years.

POTENTIAL TRAIN ACCIDENTS IN INDIA

Natural factors: In railways, the potential for railway disaster is generally due to natural disasters, including disasters related to hydro-meteorological such as track damage due to landslides, avalanches, flash floods, rain, and lightning, and geological factors such as earthquakes can damage or obstruct railway tracks that cause accidents.

Human error/ Anthropological cause: Fatigue, carelessness, corruption, or a disdain for safety protocols can all lead to human error among the railway workers, who oversee running, keeping, and overseeing the trains and lines. Miscommunication, excessive speeding, and ignoring flaws or dangers are the causes of it. Additionally, the railway employees' effectiveness and coordination are hampered by their inadequate training and communication abilities.

Signaling Failures: Errors in software, power supply, or human mistakes can all affect the signaling system, which directs and moves trains on the tracks. Trains may travel onto the incorrect track, run into stationary objects or other trains, or overshoot stops because of it.

Unmanned level crossing (UMLCs): UMLCs are locations where railroad tracks cross roadways without any traffic control devices like barriers or signals. There is a significant chance of accidents because passing cars or pedestrians can try to cross the tracks while the train is getting close. In India, UMLCs handled 16% of all train accidents in 2018-19. Although all unattended level crossings on wide gauge lines have been removed by the Indian Railways, there are still a lot of manned level crossings that present a risk of mishap.

CASE STUDY

Three train collided on 2nd of June 2023 close to the Bahanaga Bazar Railway station at Balasore district, Odisha⁶². In this incidence 296 people lost their lives and approx 1000 people were injured. The increasing frequency of large public gatherings and associated risks need innovative solutions for effective crowd management and disaster response. This study proposes how policing for public gatherings and huge festivals can be checked smartly using a drone-based surveillance system integrated with artificial intelligence to enhance real time monitoring and threat detection in large crowds. The system is designed to detect any unusual behavior, metallic objects, and potential threats such as stone pelting, weapons usage, or stampedes. Upon detecting a threat, the system will instantly allow local police units, to enable rapid

⁶²

https://en.wikipedia.org/w/index.php?title=2023_Odisha_train_collision&oldid=1175762270

and targeted responses. The effectiveness of the proposed system will be evaluated through case studies on events like Rath Yatra and other large gatherings. The study aims to prove the integration of AI with drone surveillance that can significantly improve crowd safety, reduce incidents of violence, and prevent stampedes. The findings will offer valuable insight into the potential of advanced technology in enhancing public safety and disaster management. This study will also help us understand, how we can use this technology of drones integrated with AI can help police reduce their workload and increase the efficiency for fast response and rapid actions.

Due to these railway incidents peoples and tier lives were badly affected. It affects many families, their property and wage earners, and understanding and other stress disorders, therefore. Apart from accidental death, there are many psychological traumas, and psychiatric disorders that lead to many more deaths in the family. In addition to devastating natural disasters, traumatic incidents that impact the message are widespread; all train wrecks are comparatively common traffic accidents.

RAILWAY WORK TO REDUCE TRAIN ACCIDENTS

Rashtriya rail sanraksha kosh: The (RRSK) a safety reserve for the essential resources. It was created in 2017-2018 with a fund of Rs. 1 lakh crore spread over 5 years for vital safety-related projects like bridge restoration, signaling installations, track renewals, etc.

Technological upgradation: Improved Coach and Wagon Design and Features. This includes installing an automated fire and smoke detection system in coaches, changing the center buffer couplers, and installing a bogie-mounted air brake system. Installing KAVACH, an indigenously created automatic train protection system, is also part of it (ATP).

LHB Design Coaches: Express rail coaches that are safer and lighter. Based on German technology, these coaches outperform traditional ICF design coaches in terms of anti-climbing features, fire retardant material, higher speed potential, and longer service life.

Modern Track Structure: stronger and longer-lasting bridges and railroads.

Ultrasonic Flaw Detection: The proposed method is non-destructive in nature where testing method employs a high-frequency sound waves that can inspect the rails for any fractures, defects, or flaws. This prevents any kind of derailments or accidents. It is a technique to find and remove problematic rails. After that, the damaged rails are taken out and replaced with new ones.

GPS-Based Fog Pass Device: A device to help loco pilot navigate in foggy conditions. It is a handheld GPS gadget that shows the precise distance to oncoming landmarks like level crossing gates, signals, etc. Additionally, as the train approaches a signal or a level crossing gate, it sounds a loud siren to warn the loco pilot.

Mechanization of track maintenance: An automated and optimized track maintenance system. This includes doing track maintenance tasks like tamping, dressing, stabilizing, etc. using devices like dynamic track stabilizers, ballast controlling machines, and track tamping equipment. This lowers human error and raises the standard and safety of the track.

Interlocking system: An interlocking system is a centralized control system for points and signals. It is a system that runs the points and signals from a central place using electrical or electronic devices. It also lowers the possibility of human error and improves safety by estimating the amount of manual point and signal operation that staff members on the ground would need to perform.

Elimination of unmanned level crossings (UMLCs): UMLCs are gradually being removed through the shutting, merging, staffing, or provisioning of subways, roads beneath bridges, and toad overpasses.

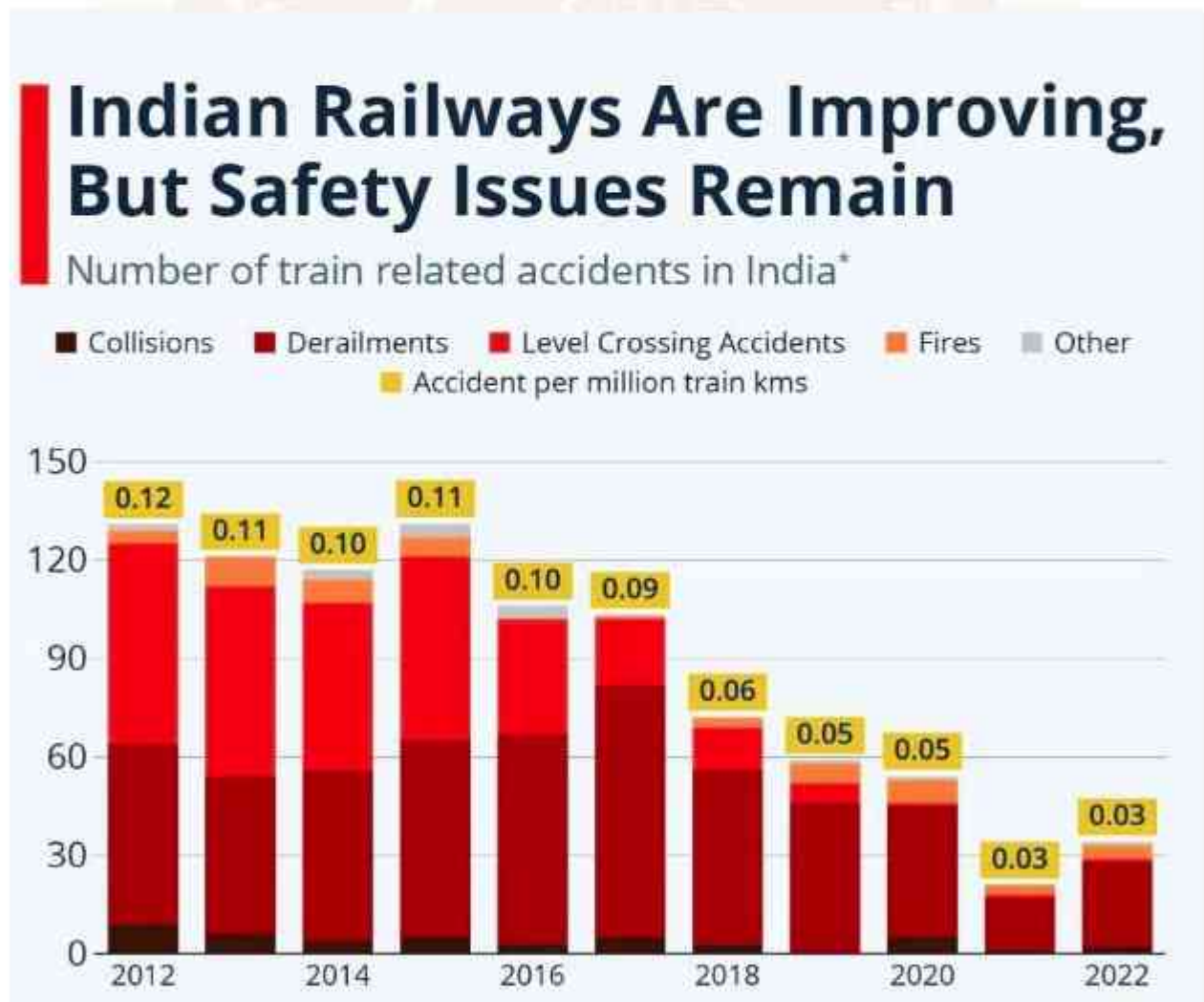


Figure 2: This Chart Shows the number of train-related accidents in India since 2012. (Source - Indian Railway Yearbook)

THE ROLE OF LOCAL POLICE TO RESPOND DURING TRAIN ACCIDENT

During any train accident, the local police have a very significant role in responding to train accidents, ensuring public safety, and helping with investigation and relief efforts.

When Local police receive information about the accident from railway authorities, emergency services, or eyewitnesses they must be prepared to reach the location as soon as possible with the largest arms and help with the coordination of the NDRF team, and medical team.

- Police teams at once go ahead to the accident site to control the rush on the scene.
- Police cordon/ personnel off the area to prevent unauthorized access, keep public safety and preserve evidence.
- Police work with emergency services (fire department, ambulance) to rescue injured passengers.
- The police team must have learned first aid to provide basic medical help until medical professionals arrive.
- Police are well-trained to evacuate passengers from the accident site.
- Developing an emergency response plan: - police can develop a plan for responding to railroad incidents.
- Direct call when a call reports a Railroad. Emergency police can direct them to the emergency notification system (ENS) sign to find the location. They can then contact the railroad police responsible for the track.
- Monitor grade crossing:- police can monitor grade crossings, educate violators, and issue citations when needed.
- Being familiar with local railroads: -police can learn about the type of products transported by local railroads and develop a map of the railroads in their area.
- The police team must collaborate with railway authorities to investigate the accident.
- Police must be trained to control and direct crowds to keep law and order.
- Police as first responders must be trained professionals, they are the first to arrive at an emergency scene. Their primary responsibility includes-
 - assessing the situation, providing initial aid to victims,
 - and ensuring safety for themselves and others
 - protecting live evidence, property, and the environment.
 - Police provide information to families of affected passengers,
 - Police ensure smooth coordination and communication between emergency services.
 - Police need to provide support to injured passengers

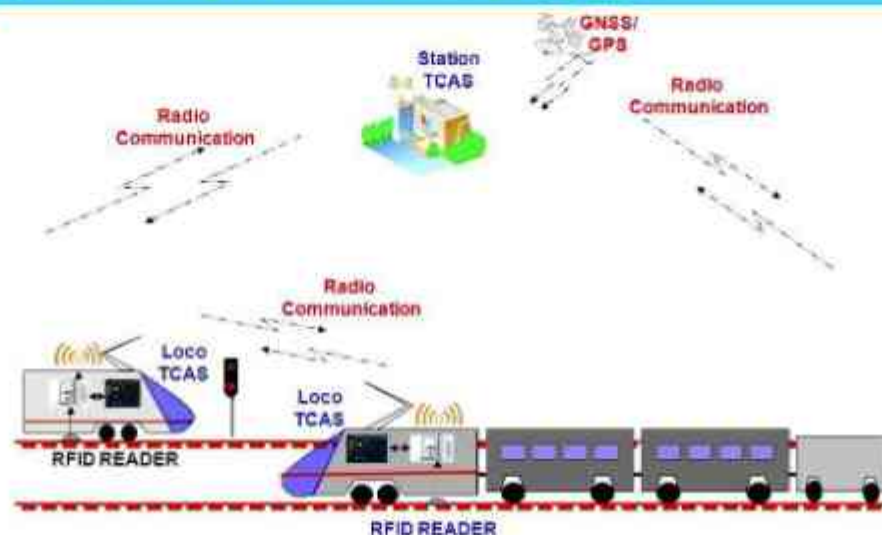
- Local police near railroads must collaborate with other agencies e.g. NDRF (National Disaster Response Force)

SOME SUGGESTIONS TO ENHANCE SAFETY

- Over-crowd control by police: - Ticket Check on a regular basis by TT or by police. Keep a balance between check and balance.
- Increased funding should be allocated for safety-related projects such as replacing deteriorating infrastructure, upgrading signalling, replacing ageing coaches, and renewing tracks. Employee education to reduce human error - give the railway employees frequent, thorough training on the newest tools, machinery, systems, safety regulations, and practices. Employ state-of-the-art technologies: - install anti-collision devices, such as Train Collision Avoidance System (TCAS) / KAVACH, Automatic Train Control (ATC), Train Protection Warning System (TPWS), etc.; these systems must be expanded to cover the entire network.
- Introduce performance-linked incentives which will pay railway employees according to how well they work and how well they follow safety protocols. Establish a Statutory Railway Safety Authority: Assign statutory authority to a railway safety authority that will be able to investigate accidents, enforce accountability and penalties for infractions, and establish safety standards. Perform Frequent Safety Audits and Inspections: - keep an eye on, assess, and audit the safety performance of the railroad personnel, facilities, and machinery; - enforce stringent responsibility and sanctions for infractions. Improve Coordination and Communication Between Police and Railway: -the railway board, zonal railways, divisions, manufacturing units, local police, research organisations, etc. should all have better coordination and communication.

TCAS - System configuration

Figure 3: A framework of TCAS system configuration
(Source - Indian Railway Yearbook)



CONCLUSION

To reduce the chances, all government authorities should obey their duties and make sure proper functioning of all the laws. All authorities, govt. Bodies are equally responsible for quick response. Police must contact local people and make a good bond. Also, a helpline should be needed to provide for quick response. Police should also keep an eye on overcrowding, railway crossing bridges, and many more aspects likewise. The above suggestions make the research needful.

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GANDHINAGAR

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THEME 4:

FUTURE OF BLOCKCHAIN TECHNOLOGY IN POLICING



INTEGRATING BLOCKCHAIN TECHNOLOGY (INVISIBLE SECURITY) IN POLICING FOR ENHANCED EFFICACY, OPERATIONAL TRANSPARENCY, DATA SECURITY, EVIDENCE MANAGEMENT

Vinay Aseri, Dr Sumit Kumar Choudhary

ABSTRACT

In this article, we will examine how blockchain technology can revolutionize the regular operations of the police force and enhance three crucial areas, including efficiency, transparency, and security. Blockchain, first recognized for its popularity in cryptocurrencies, with its corresponding distributed ledger and immutability back-end architecture, is starting to impact law enforcement's data management workflow. This system is designed to keep track of all transactions and related data in a safe, transparent, and tamper-proof manner. It can be used to maintain evidence or record police operations and investigations, and it will only allow access to specifically authorized individuals. These crucial areas for blockchain adoption were identified through research as follows: data integrity, evidence management (a tamper-proof recording of all transactions from data entered into the system is provided), security and transparency through immutable and distributed records (which determine concurrency control issues), and no prior knowledge about how each block was computed can now be proofed using actual transactions online/offline among police departments/agencies. Field-level applications have begun to benefit from transparency, integrity, and security protocols. Examples of practical global implementations by police forces include the Delhi Police's blockchain project for tracking evidence and the Dubai Police's collaboration with Cardano Blockchain on secured data sharing. Criminal investigations must enable blockchain technology to track and ensure a chain of custody.

INTRODUCTION

Initially created as a foundation for Bitcoin and other similar cryptocurrencies, blockchain technology matured into an adaptable technology suitable across multiple industries. In its essence, the blockchain is a decentralized and distributed ledger system that makes transactions or data recording transparently secure and immutable. The fundamentals of blockchain technology are distributed; there is no need for a central entity or intermediary; it is immutable, meaning the data stored in it can never be changed or deleted.; transparent, where all participants on the network have access to view and verify transactions. Such attributes are why blockchain is the perfect fit for injecting trust and accountability in systems with security and integrity requirements.

Blockchain technology could trigger a crucial transformation in law enforcement as the digital age becomes more widespread and adopted. Interoperability: Blockchain may also be a bridge linking the various police departments and agencies, allowing for an easy exchange of information and actions.

Blockchain technology (Nakamoto, 2008) is more generally recognized within the financial industry and its link to cryptocurrencies than in police, with application cases progressively developing. There are numerous possibilities to leverage this technology for enhanced information management, boosting security, and simplifying processes, which is essential as it takes care of the confidentiality and integrity of police records.

In essence, blockchain technology is all about establishing a distributed, decentralized, and tamper-proof ledger of transactions. That innate quality provides police departments with non-modifiable, unaltered, and verifiable records central to legal and investigatory processes.

Potential advantages of rolling out blockchain within this policing landscape run the gamut from greater transparency to renewed mutual trust among law enforcement departments. Blockchain technology brings transparency, resulting in better auditing, operational control, and secure data storage, preventing misuse or loss while ensuring sensitive information sharing across jurisdictions.

At the same time, inter-blockchain operability can help different blockchain platforms support the seamless transfer of information between departments and agencies, often complicated by systems and protocols. By leveraging the identical blockchain, data sharing can be done in a unified format, which eventually helps simplify communication and collaboration.

This article focuses on addressing four main objectives:

1. How can blockchain improve security and transparency in police operations?

The article is a persistent investigation into protecting sensitive police data processing using some core aspects of the blockchain – Immutability and distribution record keeping. To support this effort to ensure law enforcement officers and policymakers are confident in the integrity of the blockchain.

2. How can blockchain ensure data integrity and evidence management in law enforcement?

This article considers the possibilities of using the blockchain as a route verification tool to record all transactions and data immutably, making them available only to trusted

parties while protecting them from unauthorized access. This study has undergone analysis to give the stakeholders confidence in the rigorousness of blockchain when it comes to keeping data intact and managing evidence.

3. The article examines how blockchain can serve as a bridge connecting different police units, increasing efficiency and cooperation.

It also discusses zero-knowledge proofs, scalable solutions, and advanced technologies in this process. This examination intends to make law enforcers hopeful of blockchain's strength, as lawmakers can elevate their spirits for better inter-jurisdictional cooperation.

4. How can blockchain be utilized to create an immutable record of evidence collection and handling in forensic casework?

Evidence management plays a critical role in the outcome of a criminal investigation and the dispensation of justice. Evidence management is indispensable to determining a criminal's culpability or otherwise. Evidence management is a tool for protecting the rights of the Judiciary to be presumed innocent until proven guilty. However, several challenges have continued to make evidence management numerous challenges. As such, the traditional way of handling evidence is replete with vulnerabilities and inefficiencies. For example, an instance of compromised or tampered evidence, an error in maintaining the evidence chain of custody, or a breach into the evidence room compromises the credibility of the criminal justice set up. (Bagatarhan, G. (2024)).

Data Integrity in Daily Police Work: With such properties as immutability, transparency, and data security, blockchain could transform evidence management, investigation monitoring, information security, and other fields involving data. Given the unique nature of the police, based on credibility and integrity, such a platform containing all data inevitably immutable is more than essential. More to the point, blockchain records all transactions or changes in data, preserving law enforcement's accuracy and transparency of records. Using blockchain for police operations will assist in establishing confidence on the side of the general public and strengthen inter-agency working relationships. (Bagatarhan, G. (2024)).

BLOCKCHAIN-ENABLED TRAFFIC SYSTEM MANAGEMENT

A. AUTOMATED TRAFFIC VIOLATIONS AND FINES

- **Concept:** Create a traffic violation tracking and fining system using blockchain-enabled IoT devices (e.g., speed cameras, red-light cameras) — which issues a fine to the perpetrator's digital wallet. Invisible security encompasses these methods.

- **Implementation:** Once a violation is detected, the data about the offence (date-time of incident, location, and type of offence) is recorded on the blockchain. A fine is then automatically issued by the system and sent to the offender's registered digital wallet. The blockchain also carries the payment and dispute resolution processes. If a crime occurs where no one is present, security cameras are continuously working to capture the incident and immediately notify the relevant authorities for action. This quick notification helps to avoid a crime and allows the authorities to stop the criminal in real time. The process is securely linked with a database, effectively producing a report without altering or interfering while preserving evidence integrity.
- **Benefits:** Ease in traffic control, reduction of manual labor, and delicate issuance transparency, which prevents corruption.

B. VEHICLE AND DRIVER AUTHENTICATION

- **Concept:** Establish a shared blockchain database for vehicle registration, driver licenses, and insurance records.
- **Implementation:** Every vehicle and driver gets a unique digital identity on the blockchain. Officers can use a blockchain scanner or mobile app to immediately verify the authenticity of their documents during routine checks, at any traffic stops, or in the event of a violation.
- **Benefits:** Minimizes the risk of fraud, streamlines verification processes, and validates all available records automatically

C. TRAFFIC INCIDENT REPORTING AND MANAGEMENT

- **Concept:** The idea of designing a blockchain system for reporting and managing traffic issues like accidents, roadblocks, etc.
- **Implementation:** Incidents are reported on the blockchain by responding officers and witnesses. That report includes location, time, parties involved, and any evidence discovered. Finally, the system orchestrates follow-up to deploy tow trucks or emergency services and records all actions taken.
- **Benefits:** Speeds up incident handling, ensures the response process is transparent, and creates a clear audit trail for legal or insurance purposes.

BLOCKCHAIN FOR DATA INTEGRITY AND OPERATIONAL TRANSPARENCY

A. IMMUTABLE RECORD KEEPING

- **Concept:** Records of police activity, such as patrol routes taken and incident reports filed after interacting with citizens, would be stored on a blockchain, which cannot be manipulated or altered.
- **Implementation:** Every police action or decision will be logged on the blockchain with a timestamp and digital signature. This results in an immutable and append-only transaction log.
- **Benefits:** Greater transparency, provides a clear audit trail, and more trust in the Police Service by the general public.

B. SMART CONTRACTS FOR AUTOMATED PROCESSES

- **Concept:** Smart contracts on the blockchain can be leveraged to automate tasks like issuing fines, processing incident reports, and managing patrol schedules.
- **Implementation:** Smart contracts are programmed to be executed on demand based upon specific criteria being met. If an incident is recorded by a patrol unit, a smart contract can immediately notify authorities and update the status of that particular case.
- **Benefits:** Improve efficiency, ease the administrative burden for officers, and help ensure consistent decision-making.

C. COLLABORATIVE CROSS-JURISDICTIONAL POLICING

- **Concept:** Develop a public distributed ledger blockchain network where all police departments can join and connect for seamless collaboration in criminal tracking, information sharing, and operations.
- **Implementation:** Every department runs a blockchain node, enabling them to access and share data securely. If cross-jurisdictional cases are recorded on the blockchain, these can be tracked by all involved parties simultaneously.
- **Benefits:** Improves cooperation between departments on external factors, diminishes jurisdictional constraints regarding those agency-based silos & heightens the overall operation of law enforcement efforts.

OPERATIONAL TRANSPARENCY IN POLICING

Operational transparency in policing using blockchain: Blockchain technology promotes transparency by enabling the complex coordination and facilitation of diverse blockchain systems and protocols. This multifaceted capability is critical when constructing a police system where different government agencies and departments

might require communicating with one another rapidly and securely. Interoperability ensures that their data is intact when assets are transferred between two blockchains while maintaining both chains' security and integrity. The advanced solutions discussed below could promote interoperability, improve security, and accelerate the exchange of critical information within a police environment. Consequently, with these cutting-edge releases, the police department becomes more proficient, and cooperation will improve nationally and internationally (Bhardwaj, S. (2022)).

Blockchain Bridges (Stevens, R. (2022)) serve as critical intermediaries, allowing data and value to pass seamlessly between two blockchains that do not normally communicate directly. These bridges let transactions and intelligence move between networks without exiting their original blockchain ecosystems. Sharing timely information about criminals, evidence, or international cooperation is essentially facilitated through blockchain bridges.

Polkadot is another scalable multi-chain platform that enables radical cross-blockchain operability. In Polkadot, a leading Relay Chain connects multiple parallel Parachains that maintain their sovereignty while benefitting from pooled security.

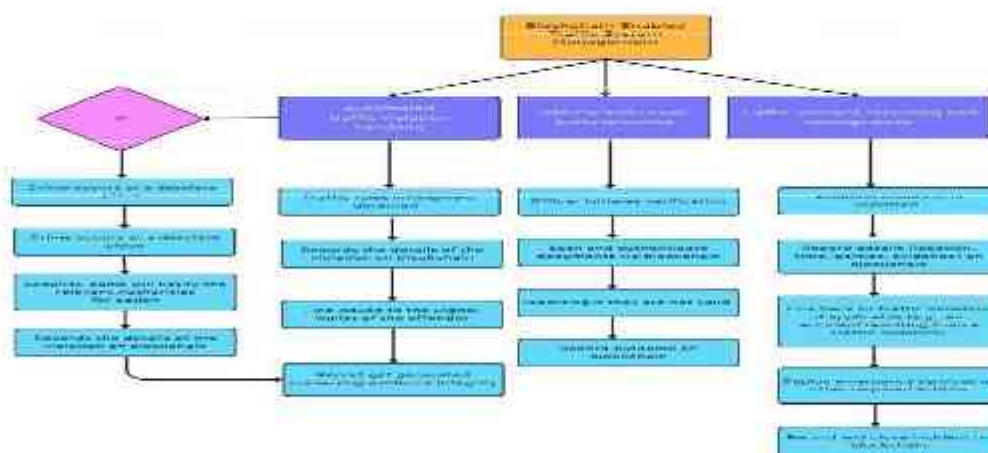


Figure 1. Blockchain Enabled Traffic System Management and Daily Police Activities Record System.

More practically, Polkadot can offer law enforcement bodies a means by which different databases and systems can seamlessly exchange real-time information — making the operation of large-scale activities like cross-border investigations or monitoring sophisticated international organized crime networks less demanding.

ENHANCING EVIDENCE MANAGEMENT WITH BLOCKCHAIN

Traditional methods use paper-based processes and central databases based on paper records. In a world that extensively uses these techniques, it is only natural that they

Blockchain Evidence, Management Control mechanisms are also controlled systems and permissioned networks. Access control mechanisms and permissioned networks enable law enforcement agencies to code information securely into a safe harbour where the anonymity of sensitive evidence can only be guaranteed for authorized individuals, keeping it isolated from any capability remotely attempting to modify or recreate that data except when legally permissible. Built for enterprise collaboration and information sharing, but across those silos privately with privacy, permissioned networks provide the confidentiality, integrity & data security needed to ensure only legitimate network members have access.

Traversing the intricate legal and regulatory minefield of evidence management creates enough problems for law enforcement organizations. Each jurisdiction will have unique rules and regulations about accumulating, analysing, or maintaining evidence that could result in inconsistencies between jurisdictions. However, gathering evidence via digital means, which may or may not include sensitive, personally identifiable information (PII), increases the possibility of inadvertently violating specific privacy laws. Criminal breach of licensing and regulations: when inspectors fail to comply with the rules (for example, recast its deficiencies so that evidence does not stand up to justice or drop charges). This mandates that law enforcement units conform to various standards, assuring the integrity and legality of the evidence they accumulate, analyze, or maintain.

5. PRACTICAL IMPLEMENTATION AND CASE STUDIES

- Delhi Police (Times, 2023) is collaborating with the Delhi Forensic Science Laboratory (DFSL) (forensicsdigest, 2024) to utilize blockchain technology for recording and tracking the evidence preservation chain. This permits the generation of immutable and transparent logs of every step in evidence handling, marking DFSL as the first institution in India to do so. Blockchain technology documents information in encrypted data blocks containing forensic records and case reports. This process has now been incorporated into Delhi's Interconnected Criminal Justice System (ICJS), simplifying data exchange between law enforcement, forensic labs, courts, and prisons. The transmission of evidence between individuals engaged is chronicled as a novel block in the blockchain, confirming comprehensive traceability and privacy protection throughout the investigative process.
- The most extensive police in the most populous state of Uttar Pradesh, Firozabad, is one busy place. Their city cops did something extraordinary by creating a path-breaking initiative using blockchain technology to track public grievances with jaw-dropping transparency. Leveraging Polygon's high-performance, secure, and

scalable distributed ledger technology (DLT), this enigmatic ecosystem allows residents to register complaints about possible misbehavior of law enforcement officials without worrying that their pleas may be ignored or tampered with. The portal, called "police complaint on blockchain" and available in the state's most common languages, offers complainants a mirror into their case with ready updates about its progress, the assignment of an investigating officer, and sporadic developments during the examination. However, while these complaints are sketched on a maddeningly cryptic ledger for the world to see through an immutable blockchain, recorded details cannot be so snarkily blacked out. This groundbreaking project could change how justice is done, and complaints are dealt with, providing transparency and oversight never before seen.

- Additionally, many pilot projects and initiatives have been launched to test the use case feasibility and, more importantly, its scalability when applied to evidence management using blockchain solutions. These require collaborative efforts between law enforcement, technology companies, and educational institutions to build blockchain solutions proven by design experience in the criminal justice industry. A pilot project by the Dutch Public Prosecution Service that utilized blockchain to improve chain of custody management for digital evidence shows how this can be achieved more efficiently and securely.

CONCLUSION

Blockchain technology, which had its significant start in cryptocurrencies, is now gradually being used within the policing environment to increase security and, at large, transparency with our goal of promoting effectiveness. Using blockchain, police departments can create secure and auditable records that will only be accessible to authorized personnel in an interoperable way.

Blockchain security continues to evolve with the opportunities, and challenges brought forward as new technologies like quantum computers and cryptography advance. While quantum computers can theoretically break existing cryptographic algorithms, they also open up the possibility of a new generation of encryption in the form of quantum cryptography that could provide even more robust protection against cyber-attacks.

In the recent past, quantum computers have become a buzzing interest because of their potential impact on secure cryptographic protocols – including those upon which blockchain technology relies. Several currently used cryptographic equations could be cracked if quantum computers were available, endangering blockchain security.

However, the growth of quantum-resistant cryptographic algorithms (also known as post-quantum cryptography) offers ways to mitigate those dangers. Using these complicated algorithms, it will fail if a quantum computer with its decisive factors attempts to break an encryption solution based upon post-quantum cryptographic protection techniques.

It is fascinating because, although blockchain technology in a police context seems appealing at first pass, it must be evaluated as part of the early investigation.

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FUTURE OF BLOCKCHAIN TECHNOLOGY IN POLICING

Purnima

S.M.A.R.T. principles – strict and sensitive, modern and mobile, alert and accountable, reliable and responsive, techno-savvy and trained should be the basis of smart-policing strategies.

INTRODUCTION

Blockchain technology has been one of the most transformative technologies in industry sectors in the past years, offering new and exciting solutions for data security, transparency, and efficiency. Even though this was popularized by its servicing role behind digital currencies like Bitcoin, the potential for blockchain stretches far beyond that. It was these intrinsic attributes of blockchain technology—decentralization, immutability, and consensus—that were initially explored for application in diverse sectors such as law enforcement.

In view of the integration of different tools—like computerized management of records and advanced forensic analysis—into policing, evolution started right after the adoption. As policing strategies and methodologies grow more dependent upon digital systems, interest in technologies that promise to enhance their integrity and transparency grows. For instance, current technological practices of law enforcement agencies in managing data and tracking evidence have several problems related to the issues of security, integrity, and operational efficiency. In this regard, blockchain technology can be viewed as a panacea against some of these pressing issues.

The paper reviews blockchain technology, its current applications in policing, and analyses how its adoption may solve existing problems and put forward new opportunities. This paper will thus adopt a descriptive approach to understanding the relationship between blockchain technology and the future of policing, putting forward both the potential and considerations to be addressed to enable its effective implementation.

BLOCKCHAIN TECHNOLOGY FUNDAMENTALS

Blockchain technology is a distributed ledger system that is decentralized, recording activities on several computers in a manner that the recorded activities cannot be changed retroactively. The basic principles of blockchain technology lie under decentralisation, immutability, and consensus mechanisms:

Decentralisation: Traditional databases are often centralized, whereas a blockchain is run on a decentralized network of nodes, meaning that no one has ultimate control over it. In this way, every participant in the network has a copy of the up-to-date ledger, indicating that the system is not dependent on any one point of failure. This enhances the resilience and security of the system.

Immutability: Truly, it isn't easy to effect changes on data once it has been recorded in a blockchain. Every block in the chain includes transaction data, a timestamp, and the hash of the previous block. Chaining blocks in a manner like this results in a secure and immutable ledger, as any change in the information of any block would mean a recalculation of the hashes for each of the succeeding blocks. This property ensures that the history of data is maintained and made tamper-proof.

Consensus Mechanisms: Consensus procedures are used by all blockchain networks to decide whether a transaction is legitimate and maintain the ledger's integrity. Through these mechanisms, it is ensured that each node in a network has reached a consensus on the state of the blockchain and prevents fraudulent activities. Common examples of consensus algorithms include:

- **Proof of Work:** Nodes solve complicated mathematical problems to validate transactions of forming new blocks. This requires a large amount of computation power and, in turn, adequate energy.
- **Proof of Stake (PoS):** Validators become elected through the use of the tokens held and deposited as collateral. This method is a lot more energy-efficient than the PoW method.
- **Practical Byzantine Fault Tolerance (PBFT):** In this method, nodes achieve consensus by a voting process. Thus, this is suitable for permissioned instances of blockchains where the nodes are assumed to have mutual trust and a known identity.

BLOCKCHAIN WORKING PRINCIPLE

Blockchain works by the accompaniment of its components in the following manner to create a secure and transparent system:

Blocks: A blockchain is a sequence of blocks, each of them containing a linked list of transactions. Every block consists of a header, which itself contains metadata, such as the unique identifier of the block, the hash of the previous block, a timestamp, and a set of transactions. Blocks are created through a process known as either "mining" or "validation," depending on the consensus mechanism used.

Chains: Events are all linked in chronological order, thereby making a chain. The hash of each block acts like a digital fingerprint, which is a unique identity of the block based on its content and the hash of the previous block. This makes it clear that, once a block is added to the blockchain, it is in the ledger permanently. Any alteration in the data of a block would need the recalculating of hashes of all succeeding blocks, which will render tampering futile.

Nodes: Individual computers or servers involved in a blockchain network are called nodes. Each node contains a copy of the blockchain and works on independent transaction validation and propagation. Further subcategories of nodes include lightweight nodes, which retain only a portion of the blockchain data, and full nodes, which retain an entire copy of the blockchain.

Smart Contracts: Smart contracts are self-executing contracts, which means that the parties' agreement is encoded directly into the code. According to predefined rules and conditions, the contract automatically enforces and executes the agreement. Smart contracts are stored and executed on the blockchain, which makes it possible to automate processes, thereby reducing most intermediary requirements, increasing efficiency, and minimizing the possibility of error or fraud.

CURRENT APPLICATIONS OF BLOCKCHAIN IN LAW ENFORCEMENT

The technology of blockchains is finding increasingly rewarding applications in the domain of law enforcement, bringing innovation to bear on some of the long standing challenges in the sector. Applications of blockchain in policing surveyed herein include evidence management, identity verification, data sharing, and interoperability; traffic management systems; and the securing of e-FIR data. Each application, derived from the core characteristics of decentralization, immutability, and mechanisms of consensus, makes law enforcement operations more effective and secure.

EVIDENCE MANAGEMENT

Of all the possible applications, the most promising application of blockchain in law enforcement is through evidence management. Conventional evidence management systems usually have allegations of tampering, loss, or mismanagement associated with them. This can easily be solved by blockchain technology, which will keep a transparent, immutable record of the movement of evidence from the scene to the courts.

In confirming the authenticity of the evidence and persuading the fact-finder, the chain of custody is equally important. Paper-based systems are the main tool used to operate the traditional chain of custody. The data is made sure to be delivered with the reliability ensured by the signature of police officers or persons in charge of the evidence, to deliver it to the second stage. Moreover, order tracking from the chronological, well-documented delivery path would allow the fact-finder to track and determine the veracity of the evidence, independent of the various entities involved in the transmission process. To ensure the provenance and integrity of digital evidence, however, the paper-based chain of evidence custody is woefully insufficient. For crime facts stored or transmitted in digital form, such problems are magnified by the anonymity, speed and volatile nature of digital evidence. Of course,

the traditional paper chain of evidence needs great time consumption and huge human resources to demonstrate legality in court. The most important step, which is an important part of the investigative process, is the examination of digital evidence. An example of this would be the "Blockchain of Custody" framework.

It utilises blockchain in the execution of digital forensic works, from the preliminary investigation, to case management, and through the court steps. The magic programmed in blockchain, which allows digital evidence to be stored in an additive sequence yet inalterable and at the same time traceable, is thus demystified. For instance, in crime scene investigation, the collected physical evidence is available in its digital form, hashed, and ultimately stored on the blockchain. An audit trail is created to assure integrity and authenticity, thus evidencing all actions made with the evidence throughout the process. In the search phase of forensics, the blockchain will generate hash values of the evidence collection to be uploaded to the blockchain. Smart contracts will control and define authorization and access rights, ruling that only one in authority can interact with the evidence. This ensures that there are no unauthorized alterations, and it shows clearly the chain of custody.

IDENTITY VERIFICATION

Blockchain technology improves identity verification in law enforcement through a decentralized secure credential management system. The application is crucial in checking the identity of all persons involved in investigations, including witnesses, suspects, and police officers. Blockchain will help law enforcement agencies ensure that identity information is stored safely and cannot be manipulated.

One such application in this domain is the creation of a blockchain-based digital identity system, which would record and verify people's credentials. This can be very instrumental in easing the confirmation of identities on persons under investigation, which is part of criminal investigations, hence reducing the chances of false identities and fraud.

DATA SHARING AND INTEROPERABILITY

Effective data sharing and interoperability among the diverse law enforcement agencies are the cornerstones of addressing key complex criminal cases, given the crimes perpetrated across the border. The security and effective sharing infrastructure would be designed by blockchain in the sharing of decentralized platforms or interoperable services.

At the case-management level, blockchain technology supports the secure transmission and sharing of case details across different agencies. The use of smart contracts ensures the control of access such that uploading, updating, or querying digital pieces of evidence can only be conducted by authorized investigators.

Consistency in data is thereby it being both accurate and not allowing any form of unauthorized access or manipulations.

SECURING E-FIR DATA

The main problems concerned about it are non-registration, false enrollment, and integrity of e-FIR data. Police corruption, inefficiency, and warrant of responsibility are the causes of these issues. Data from e-FIRs was first kept in a central database of any local police station, which also collaborated with police station headquarters. Since the police station has original control over the e-FIR database, the data could thus be easily altered. Therefore, applying blockchain technology to this problem will help to respond to security challenges and hence endeavour data integrity since blockchain represents a flexible, distributed tally of fraud, which can record all the deals in a Peer-to-Peer (P2P) network. With its decentralized architecture, blockchain has proven to be the most effective method for securing distributed network communication in the cryptocurrency space.

In such a scenario, an intellectual framework can be considered that uses blockchain technology to maintain better integrity of e-FIR data within a centralized police database in a smart city context. This comprises the following two major components: a tamper-proof system using distributed blockchain ledgers and smart contracts to preserve the e-FIR data's integrity, and blockchain-based credential storage for auditing purposes in order to avoid fake registrations of e-FIRs. The proposed system architecture involves the following steps:

1. **Police Station Registration:** Headquarters create a unique blockchain address for each police station through a smart contract, incorporating details such as location and staff.
2. **e-FIR Filing by User:** Citizens fill their e-FIRs in an interface to the system, which in turn connects to a central database that filters only valid submissions. The data on e-FIR submitted by an individual is hashed and stored on the Blockchain ledger to ensure its immutability.
3. **Admin Approval:** After approval from the police station admin, the e-FIR data hash gets uploaded to a private blockchain, securing data integrity against fraudulent submissions.
4. **Processing False e-FIRs:** If a false e-FIR is suspected, it can be pointed out by the accused to the superintendent of police and can be verified, and investigated accordingly with the help of immutable blockchain records and their timestamps.

The framework enhances transparency, minimizes fraud risks, and ascertains that the e-FIR data is accurate and secure at all instances of the process.

BENEFITS OF BLOCKCHAIN TECHNOLOGY FOR POLICING



This blockchain technology offers a variety of benefits to policing in terms of transparency, operational efficiency, and data security. Its decentralized nature and cryptic hashing retain the data secure and tamper-free, hence providing an immutable and reliable source of truth for law enforcement agencies. This level of integrity in data is paramount for maintaining accuracy and security over sensitive information, such as criminal records and evidence. Moreover, blockchain enhances transparency and accountability by creating a visible, auditable record of transactions and actions. Every transaction is time-stamped and made available for the eyes of authorized participants. This prevents corruption, detects unauthorized alterations, and increases more trust of the public in the policing system.

Blockchain technology further eases law enforcement operations by reducing bureaucratic inefficiencies and automating administrative tasks using smart contracts. This brings faster and more accurate processing of tasks, like validating e-FIRs and case information management. Improved evidence tracking and chain of custody management are other major benefits; blockchain provides an immutable ledger to track the evidence from collection to presentation in court. It maintains integrity and supports admissibility in court by preserving each piece of evidence and its changes and transfers. In this way, blockchain offers forensic investigation better reliability and credibility.

CHALLENGES AND LIMITATIONS

Technical difficulties that must be surpassed in the implementation of blockchain technology into law enforcement include scalability issues, interoperability, and integration problems. Scalability issues emanate from traditional versions of blockchain. These versions may sometimes be overwhelmed by transaction volumes. Sharding and more efficient consensus mechanisms, like Proof of Stake, might solve these issues, but careful planning will be required. There is also the problem of interoperability that makes sharing and integration across jurisdictions difficult due to varying systems and blockchain platforms. Effective solutions will want to ensure their systems are compatible with the existing ones while standardizing protocols

across the different networks. Joining these into current workflows with legacy systems means compatibility issues, retraining employees, and updating procedures.

This becomes critical with respect to the legal and ethical concerns to do with privacy, protection of data, and compliance. In Blockchain, transparency and immutability may very well conflict with the right to privacy since it is impossible to change or delete data, so there needs to be a balance between transparency and protection of personal information. Compliance with data protection laws, notably the GDPR, includes secure encryption and handling data erasure requests, which may be complex due to the blockchain's nature. That is, blockchain systems are in compliance with the law – making sure they comply not only with data management but also with evidence handling and transfer of data across borders, where very close collaboration with legal experts will be required.

Noticeably, this involves significant cost and resource implications, with big infrastructure set-up costs at the beginning and related continuous maintenance and scaling-related expenses afterward. In this respect, agencies should consider the array of benefits blockchain can deliver and budget accordingly. This makes the adoption of blockchain resource-intensive in terms of technical capabilities and building of infrastructure, staff training, etc. Agencies must make sure that sufficient capability and support is available to see the implementation through and the successful operation.

CASE STUDIES AND PILOT PROGRAMS

Estonia's Evidence Management System exemplifies the effective use of blockchain technology in law enforcement. Indeed, Estonia is rated very highly when speaking about new digital initiatives, so the purpose of implementing a blockchain-based evidence management system in this country is to secure the integrity and security of digital evidence. In this respect, the system will log evidence on an immutable Blockchain ledger, providing an incorruptible, transparent audit trail of all interactions and changes. Integration with current forensic and case management tools streamlines operations even further. It was guaranteed to succeed by the great governmental support of Estonia in this matter, its highly evolved digital infrastructure, and the inherent transparency and reliability instilled by blockchain technology itself. This system has therefore significantly enhanced both the reliability and integrity of digital evidence, setting up a global benchmark for blockchain applications in the field of law enforcement.

In The City of Lugano, Switzerland, a blockchain-based evidence management system has been successfully implemented to track and manage evidence within the police department. This system deploys a decentralized ledger for the purposes of recording evidence; therefore, the opportunities for tampering are minimal. Automated smart

contracts help manage evidence transactions to ensure handling protocols are complied with, and at the same time, thorough tracking improves accountability factors.

RECOMMENDATIONS FOR IMPLEMENTATION

Effective integration of blockchain technology into law enforcement requires initiation with a comprehensive needs assessment to spell out certain challenges and opportunities, such as the development of evidence management or case tracking processes. The implementation should have a gradual approach that starts with pilot projects to show the effectiveness of blockchain in less critical areas before scaling up. Some of the other essentials are making it compatible with existing systems, with relevant attention toward strong data security and privacy measures. Agencies should also clearly detail the policies and governance frameworks in relation to managing blockchain networks, including conformance with the applicable legal requirements.

Agencies should develop full-fledged rules regarding data integrity, access controls, and compliance, and provide for their updating cyclically to keep abreast with changes in technology and regulation. There is a need to build collaboration between agencies and engender public trust through open communication. Continued funding of research and development will underpin technical advances and betterments. Training for personnel is, therefore, very important, ranging from the technical and practical use cases, including user-friendly resources and support networks that can be used to manage the system.

CONCLUSION

Blockchain technology holds great promise in terms of the operational efficiency of law enforcement and the integrity of data. Major findings show that blockchain considerably improves evidence management, secures data handling, and increases transparency. Successful pilots, like the ones deployed in Estonia and the City of Lugano, prove that blockchain can offer immutable records, transparent audit trails, and easy integration into forensic systems. Despite this, challenges about scalability, interoperability, and privacy have to be overcome for blockchain to deliver what it promises. Blockchain technology envisions a future where policing will change into a secure and transparent methodology for evidence management and case tracking, devoid of data tampering and procedural errors, and rebuilding faith in the criminal justice system. A marriage of blockchain to the other technologies of the future, namely, artificial intelligence and the Internet of Things, could further propel its impact on law enforcement. More R&D is required to iron out technical and legal issues that arise in the way and also to extend applications with an assurance of effective execution. In the same dimension, any blockchain solution will have to involve collaborative efforts of technology providers, law enforcement agencies, and academic institutions towards furtherance. On the ethical front, data privacy together

with regulatory compliance are issues that definitely will need to be considered as the technology matures.

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About the Author

The author holds an MA in Forensic Psychology.

FUTURE OF BLOCKCHAIN TECHNOLOGY IN POLICING

Mohit

ABSTRACT

Blockchain technology, at the start, was designed for various cryptocurrencies such as Bitcoin, Ethereum, etc. It has evolved beyond its original scope and works on the principle of decentralized, distributed ledger technology that ensures the distribution of digital information serving as an immutable ledger of transactions. Its potential applications are in different sectors such as finance, supply chain management, healthcare, and even law enforcement. Understanding the future of blockchain technology and its significance to law enforcement is crucial as it reshapes how data is handled, transactions are verified, and crimes are investigated. Additionally, the paper discusses the future aspects of blockchain technology and challenges in different wings of police and security agencies.

INTRODUCTION

It will explain how blockchain can resolve different kinds of issues faced in data management, and evidence handling. Blockchain is based on a decentralized, immutable ledger of transactions that records on different connected devices. Once a transaction is made, it cannot be altered, it remains secure. Every device is time-stamped and linked to the previous one and makes an unbreakable chain of data blocks.

MOTIVATION

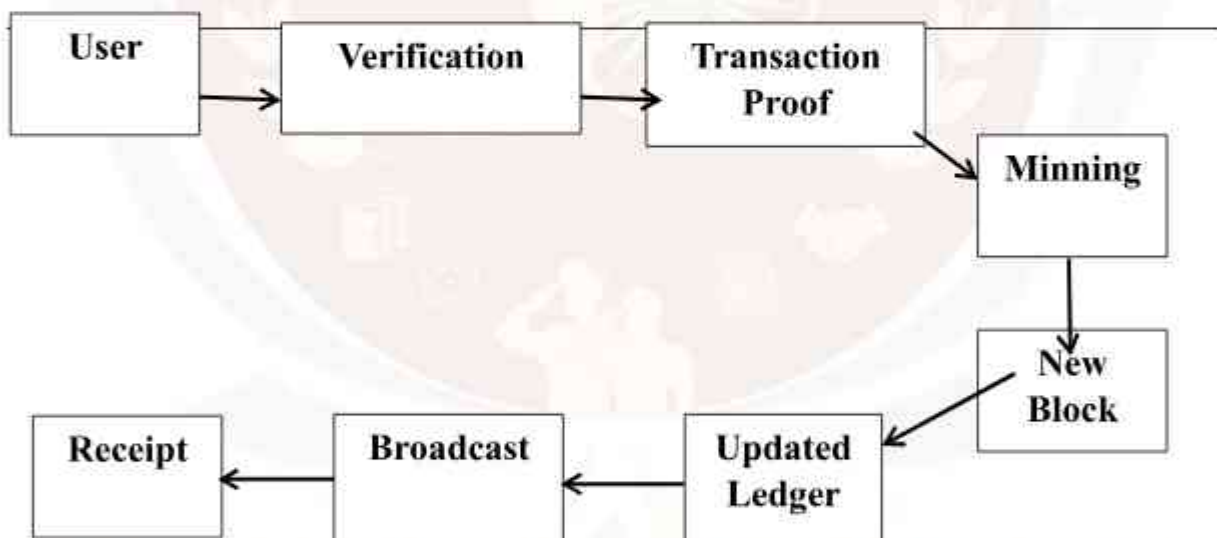
1. A Criminal Record Keeper System using Blockchain which helps in fast track investigation
2. Prevention of evidence Tempering & Evidence Management
3. Prevention of Absconders
4. Traffic Police Management system
5. Police Verification System
6. Fire Alarm System
7. Prevention of paper leaks
8. Cyber Financial Crime control system
9. Centralized tracking system for arms and ammunition
10. Blockchain-Powered Police Complaint Management System For Enhanced Transparency
11. Use Health Records in Police Investigation
12. Blockchain-Based Approach for Tracking Global Criminals

HISTORICAL DATA

There are several examples of successful implementation of blockchain technology in governments including Estonia, the UAE, Georgia, Singapore, Sweden, and Australia.

- (1) Dubai: Dubai Police will use Carnado to share Bullet Scans in blockchain Policing.
- (2) Estonia: The Digital Republic Secured system, The Blockchain Pioneers system. Integrated blockchain to secure health records, and judicial, legislative, security, and commercial code systems
- (3) UK - Blockchain-as-a-service (BaaS)
- (4) UAE - Emirates Blockchain Strategy 2021 with the idea to transform half of government transactions through Blockchain.
- (5) China - Blockchain Service Network (BSN)
- (6) Singapore - Initiative called Project Ubin.

HOW BLOCK CHAIN WORKS



OBJECTIVES & MATERIAL METHODS OF IMPLEMENTATION OF BLOCKCHAIN IN POLICING

1. A CRIMINAL RECORD KEEPER SYSTEM USING BLOCKCHAIN WHICH HELPS IN FAST-TRACK INVESTIGATIONS:

- Most of the existing criminal record systems need citizens to add FIRs and police officials to approve or reject them, which makes things even more complicated for authorities.
- With the use of blockchain our system makes existing realworld system processes more efficient, faster, easier, and more secure.

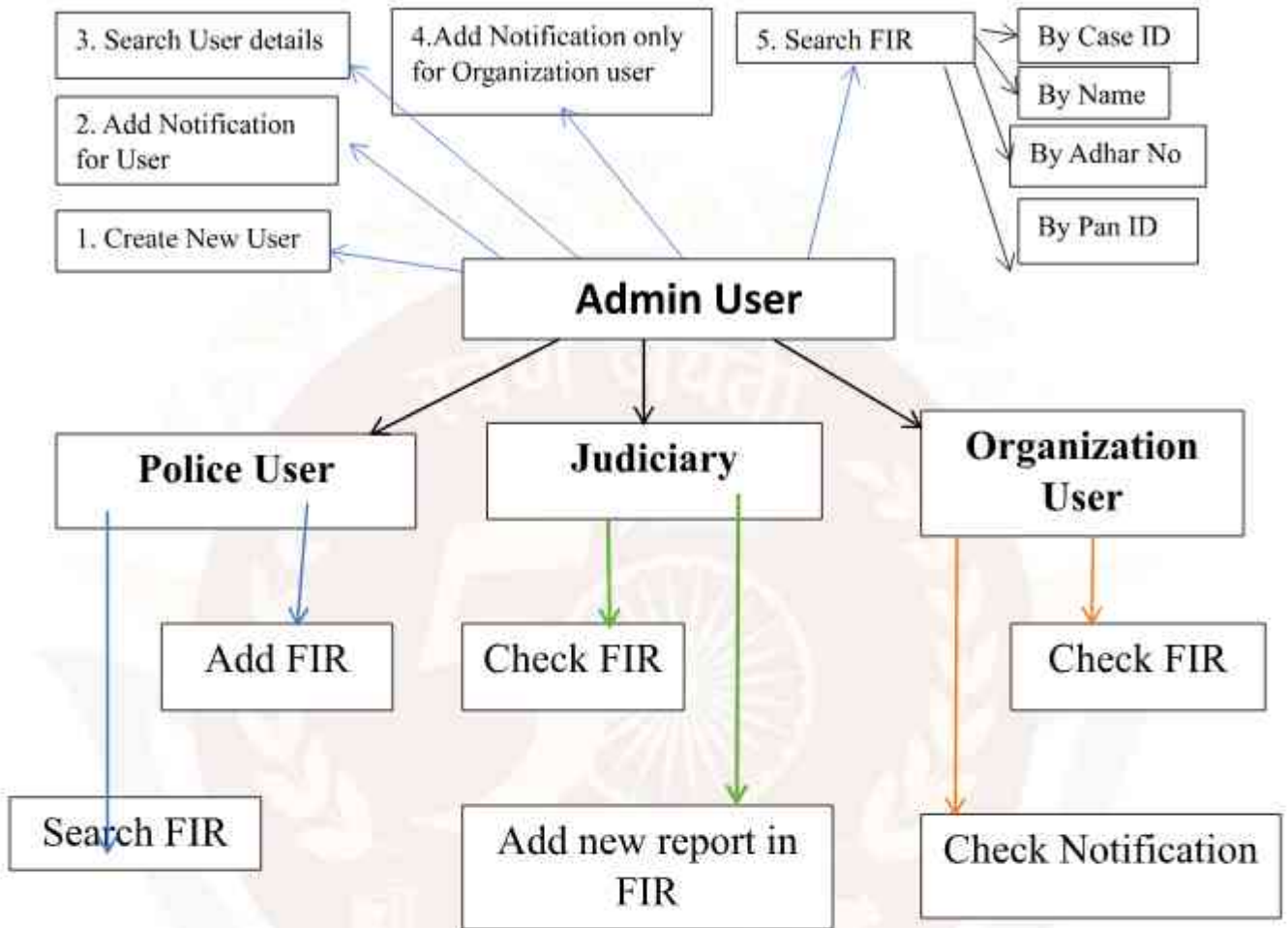


Figure – 1) Criminal Record Keeper System using Blockchain

2. PREVENTION OF EVIDENCE TEMPERING & EVIDENCE MANAGEMENT -

Blockchain can be used to create an immutable record of evidence. By recording each step of the evidence chain on blockchain, law enforcement can ensure that evidence is tamper-proof and its integrity is maintained throughout the investigative process.

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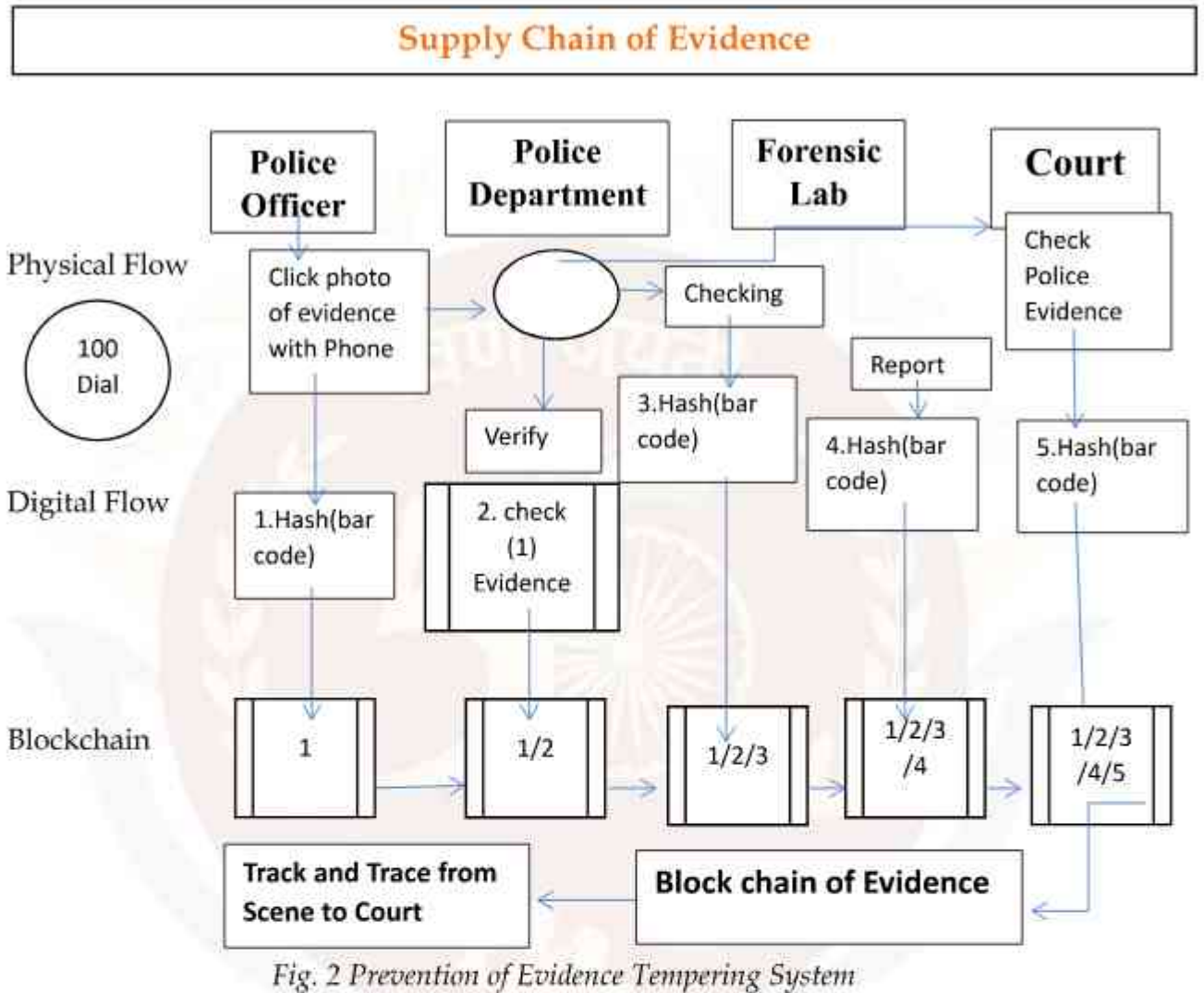
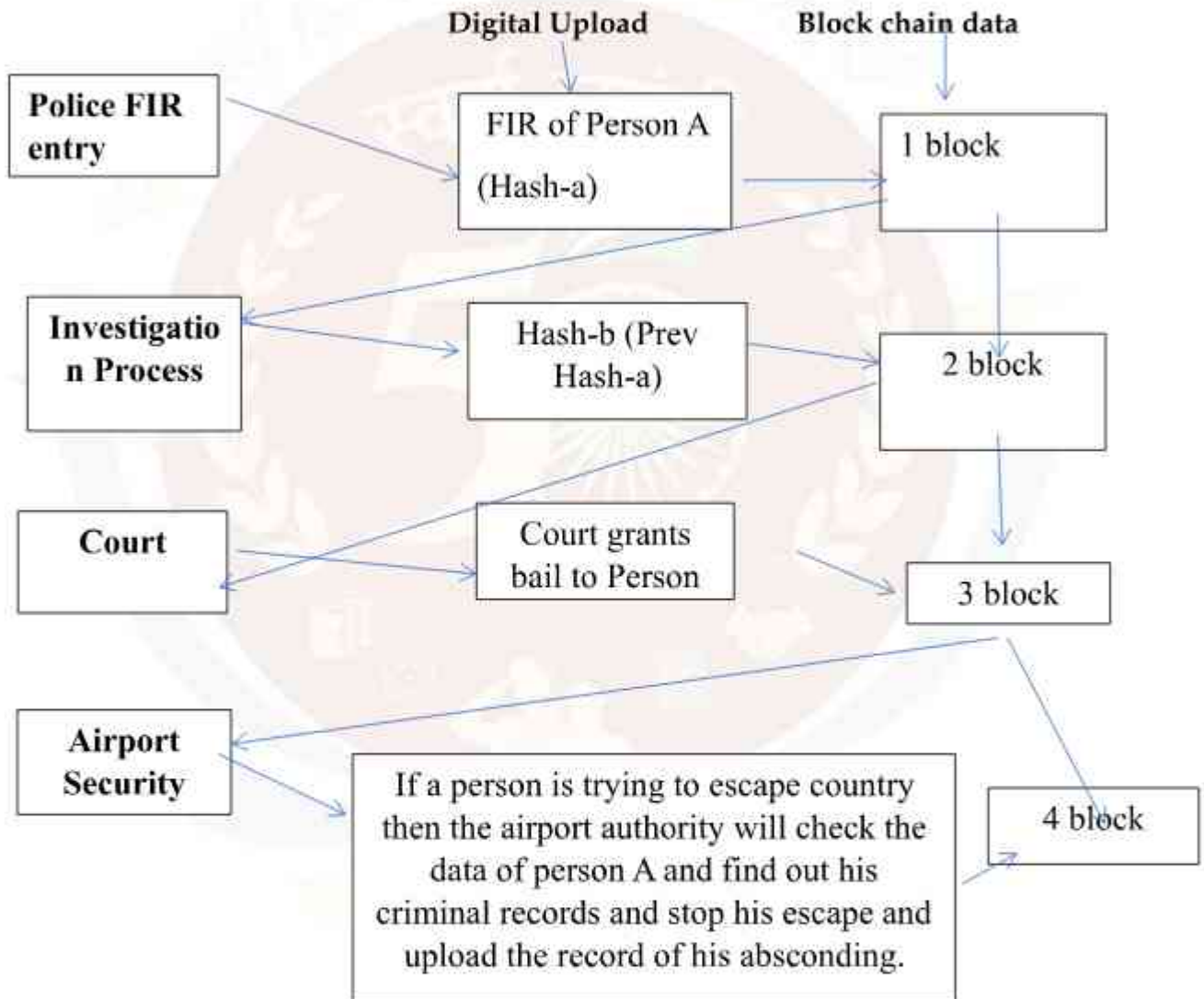


Fig. 2 Prevention of Evidence Tempering System

03. ABSCONDING OF CRIMINALS

Absconding Meaning- Absconding is defined as the intentional leaving of a place without informing the concerned authorities. It can also be defined as the act of fleeing to avoid legal proceedings.



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4. BLOCKCHAIN TRAFFIC INVOICE SYSTEM

- The system helps to maintain transparency between traffic police and travellers.
- Traffic police maintain a permanent record of traffic offenders
- Automated Challan can be done through the system

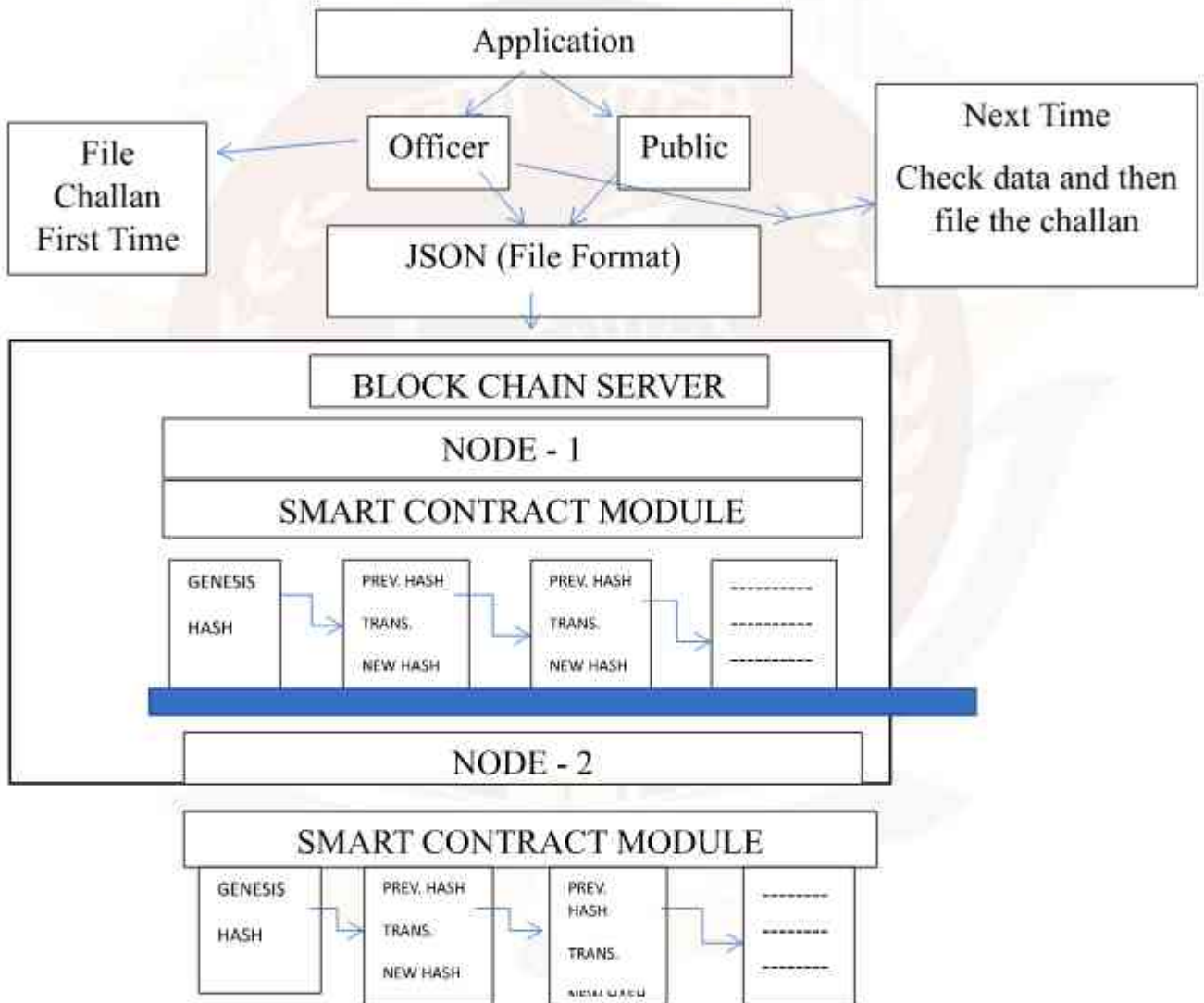


Fig . 4 Traffic Police Management Blockchain Model.

5. POLICE VERIFICATION FOR RECRUITMENT

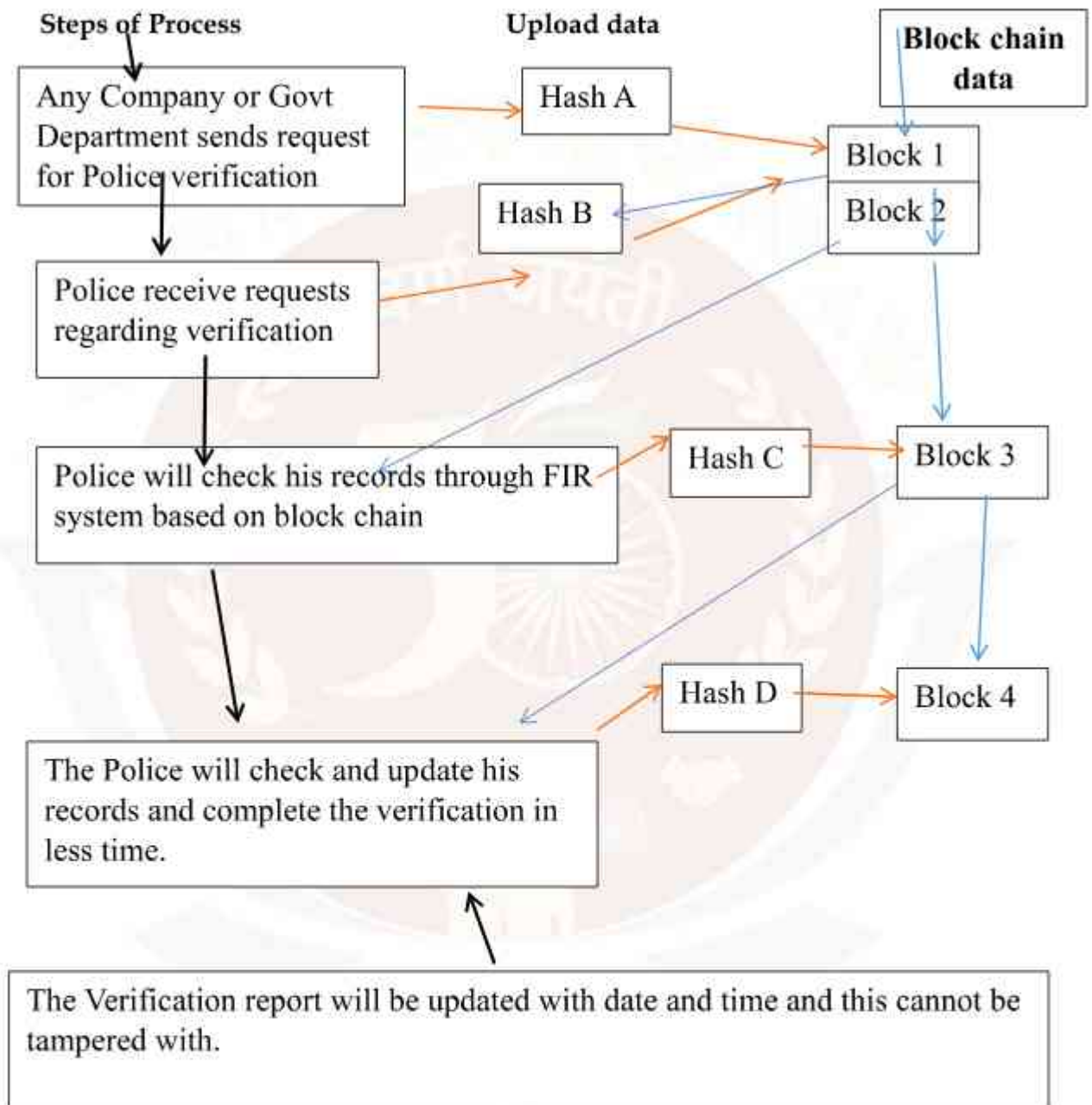


Fig. 5 Police Verification System

6. FIRE ALARM SYSTEM

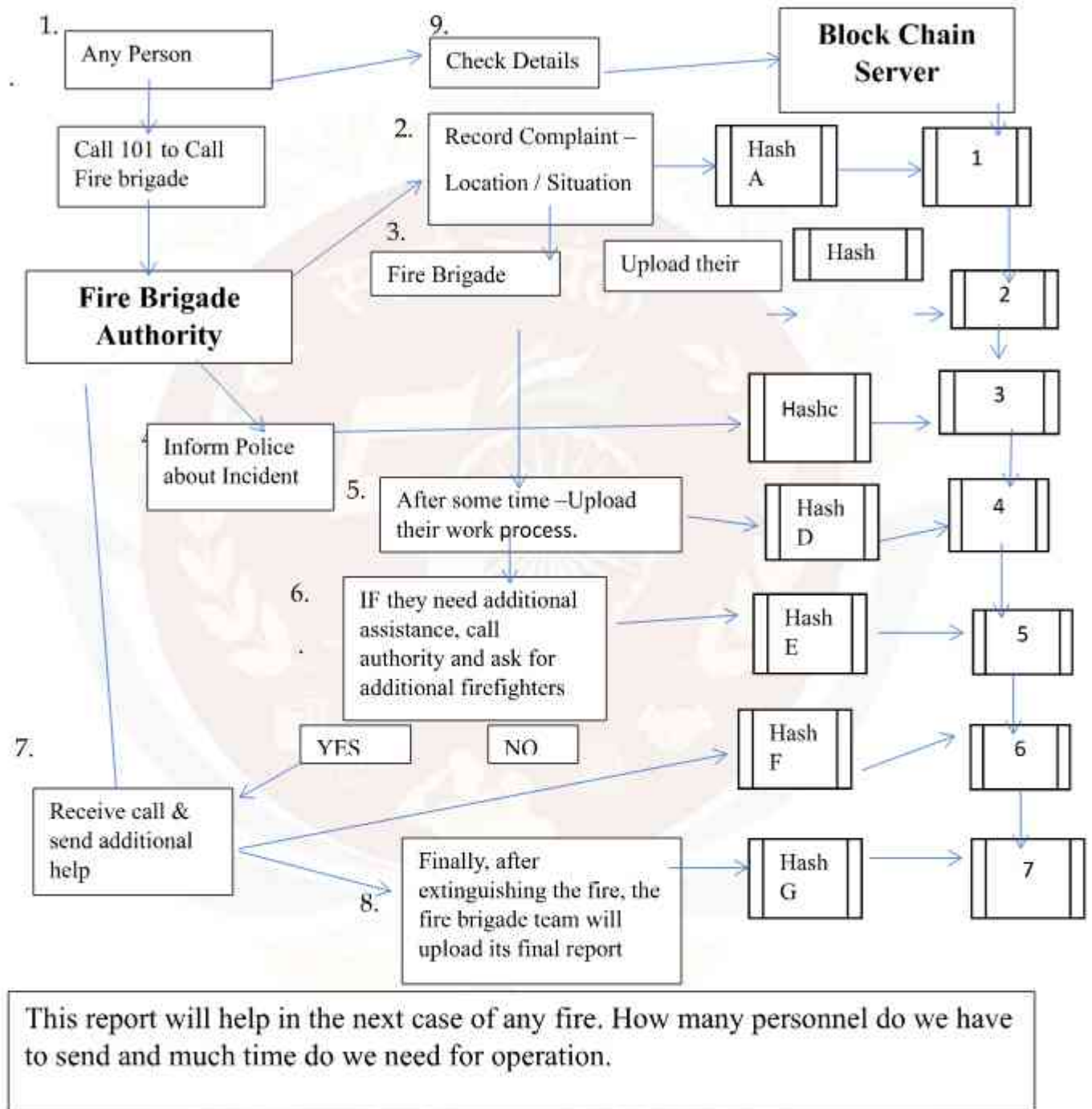


Fig. 06. Fire Alarm System

7. BLOCKCHAIN SYSTEM FOR PREVENTION OF PAPER LEAK

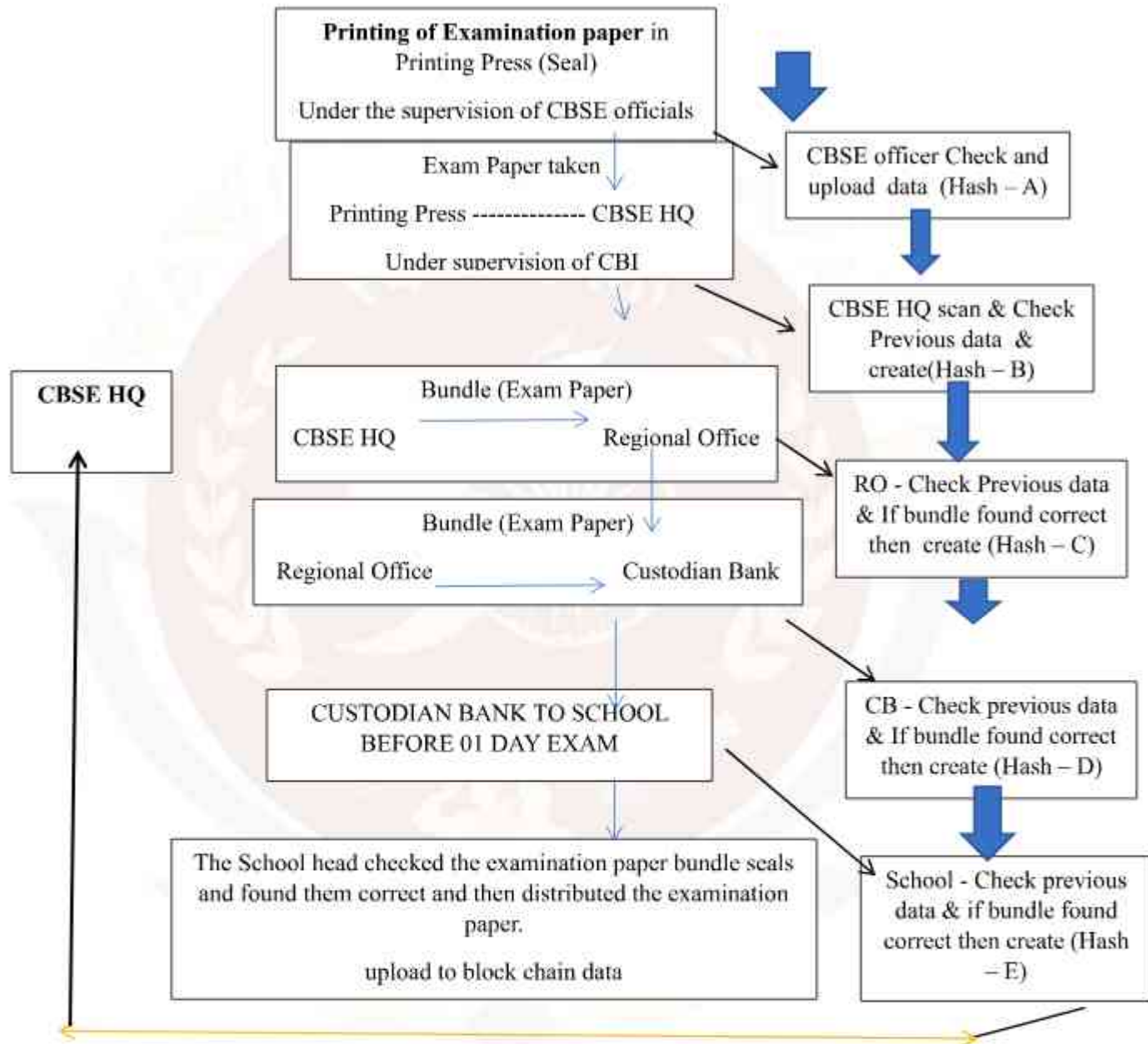


Fig.07. Prevention of paper leaks

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8. CYBER FINANCIAL CRIME CONTROL SYSTEM

UPI Payment Process -

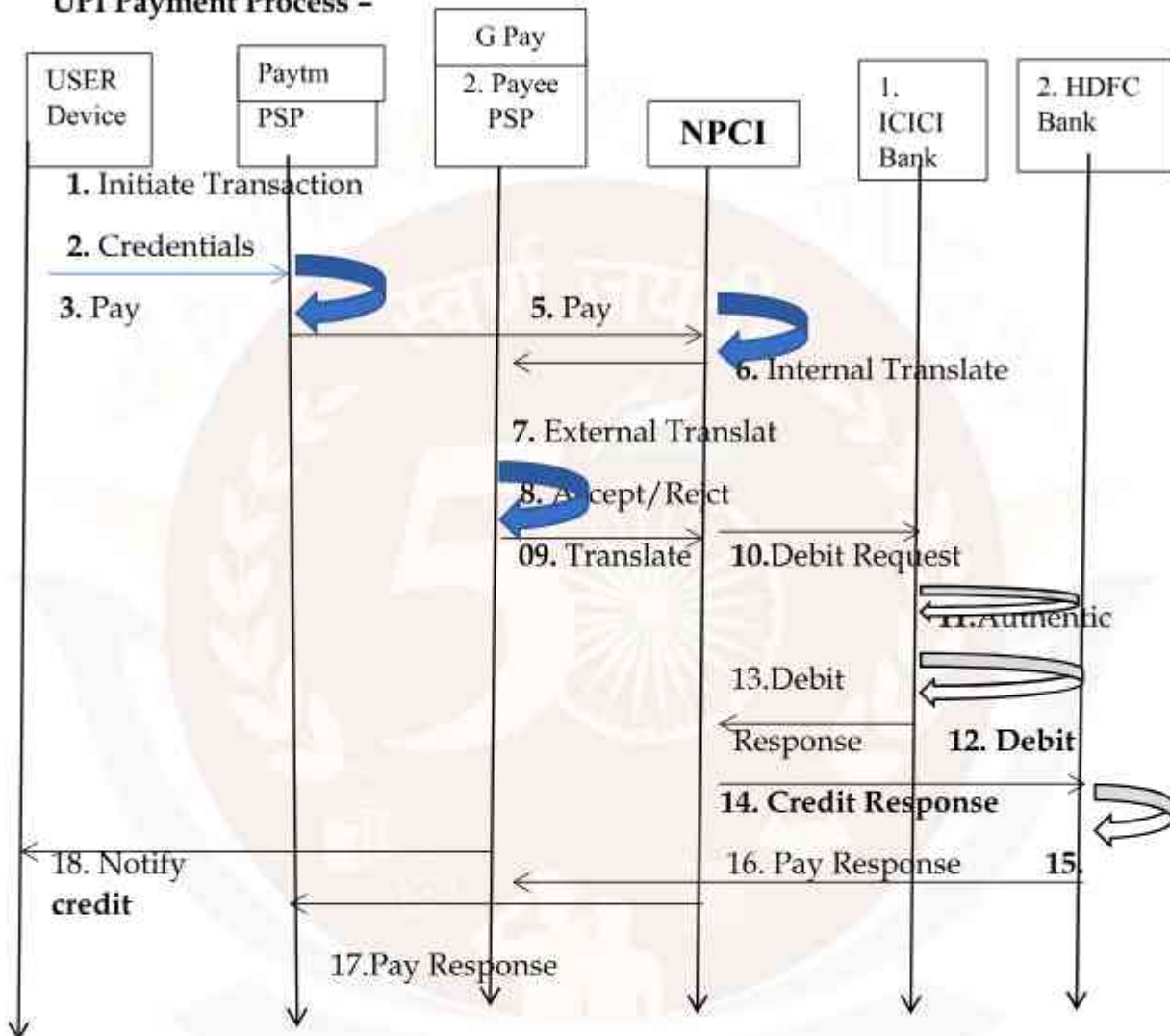
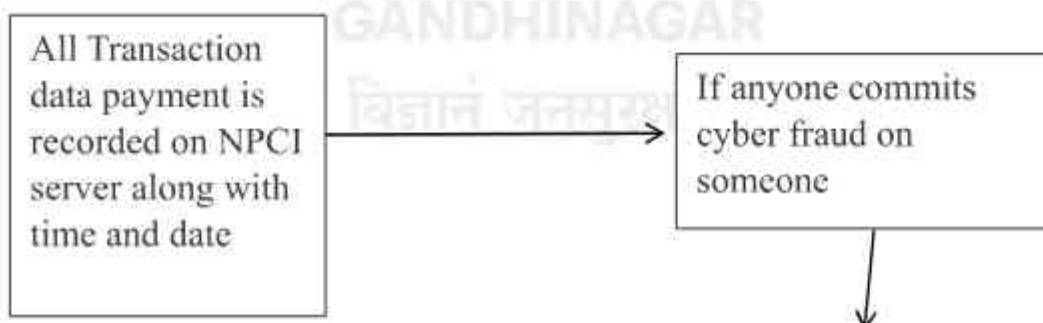


Fig .08.(A) Cyber Financial Crime Control System

Blockchain security features can help protect against data breaches and ensure the integrity of digital evidence. Furthermore, blockchain can be used to track and trace cybercriminals, as all transactions and interactions are recorded on the ledger.



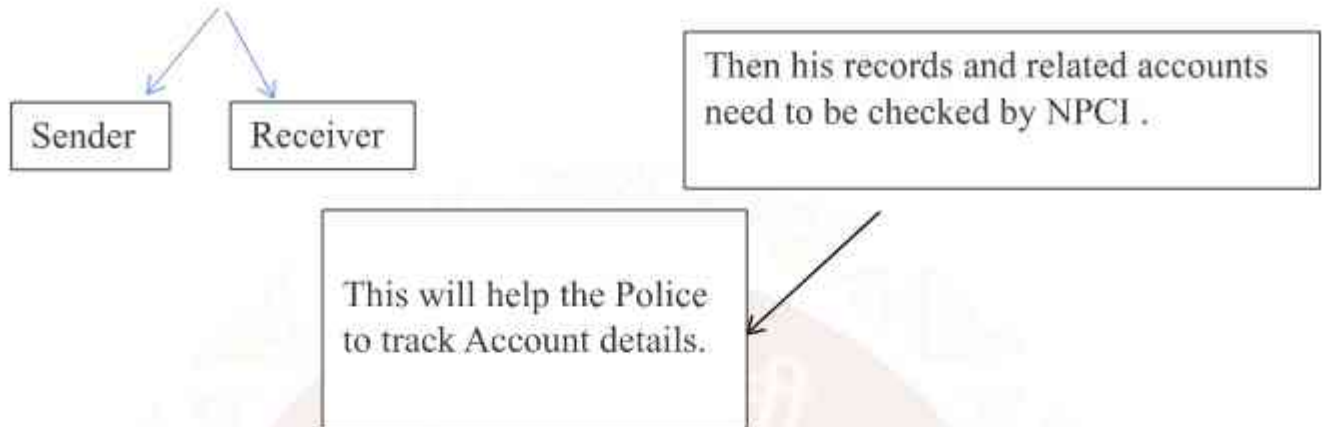


Fig .08 (B). Cyber Financial Crime Control System

9 ARMS AND AMMUNITION TRACKING SYSTEM USING BLOCKCHAIN TECHNOLOGY

We have come across many cases in which the individual shares access to the ammunition without having the required license.

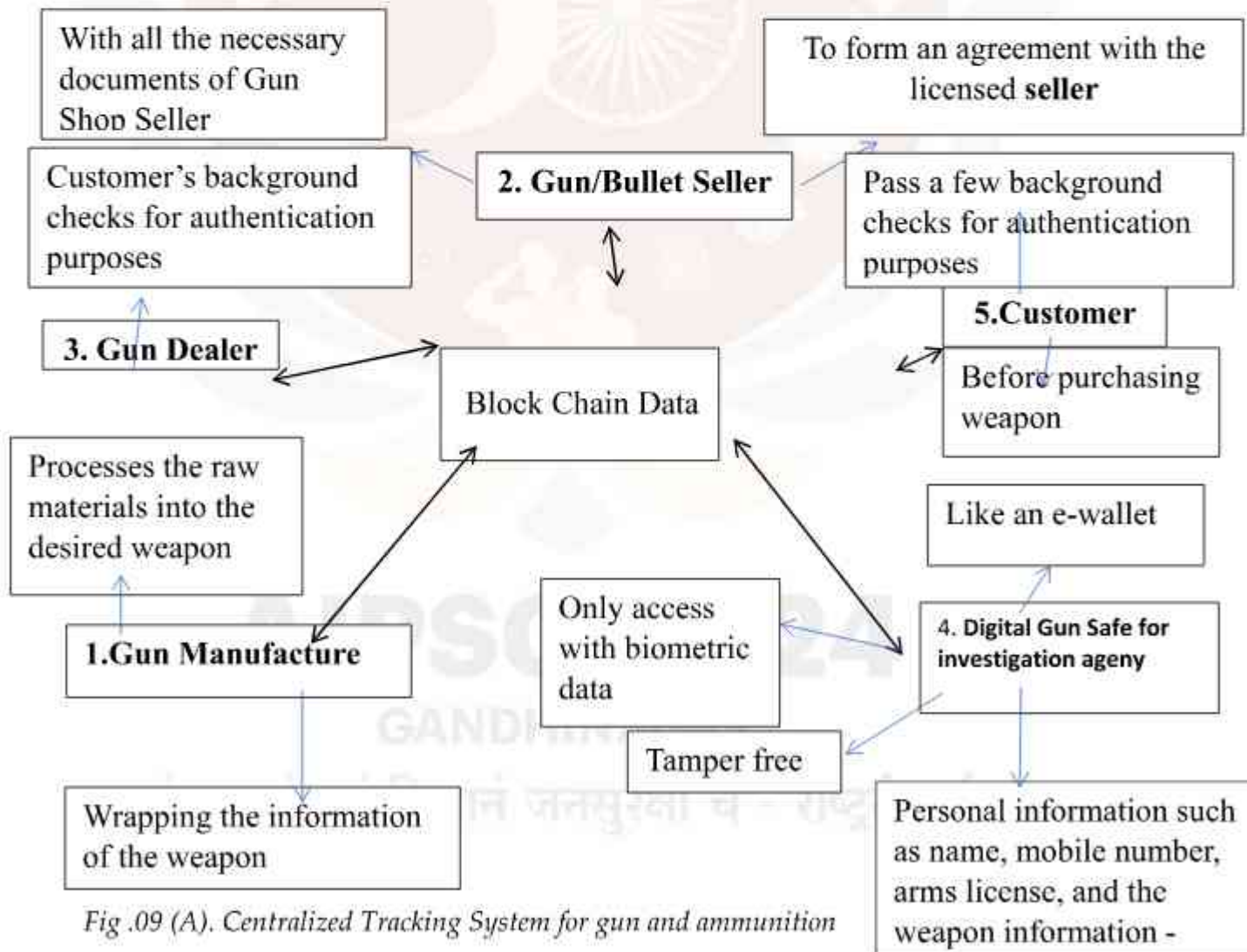


Fig .09 (A). Centralized Tracking System for gun and ammunition

If Law agency captures any weapons or ammunition then they can easily check the details of these weapons by the use of Blockchain data.

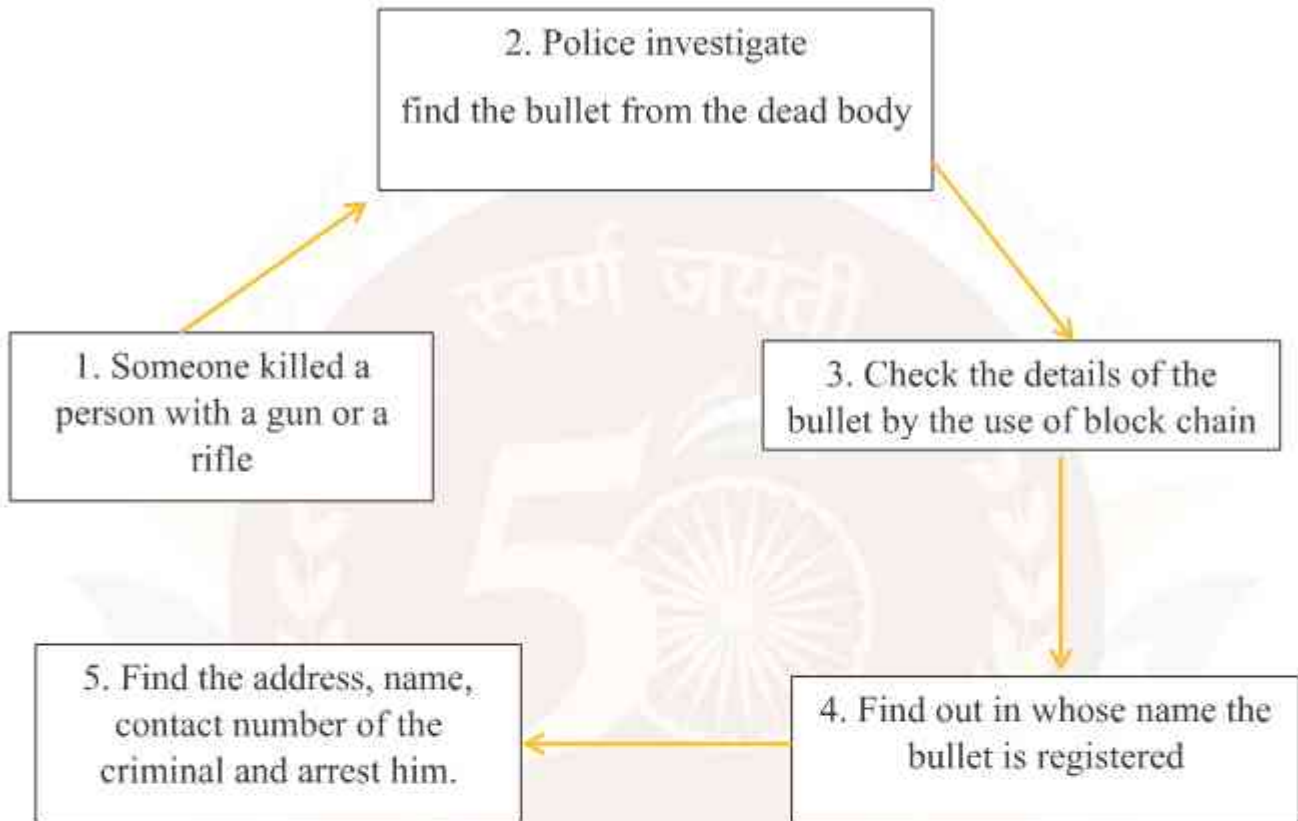


Fig09. (B). Use of Block chain data to investigation

10 BLOCKCHAIN-POWERED POLICE COMPLAINT MANAGEMENT SYSTEMS FOR ENHANCED TRANSPARENCY-

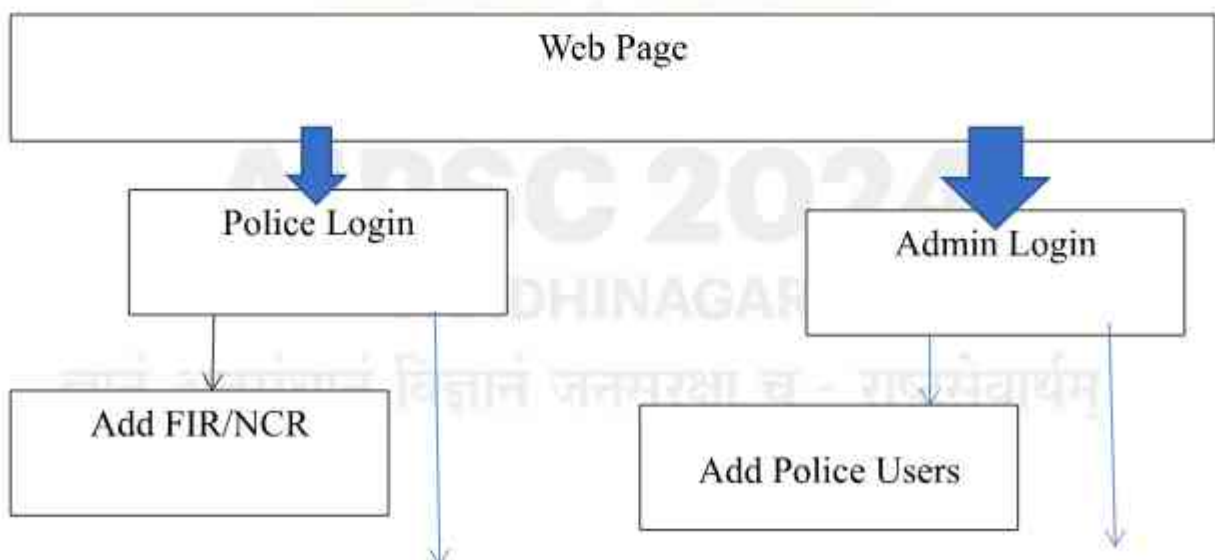
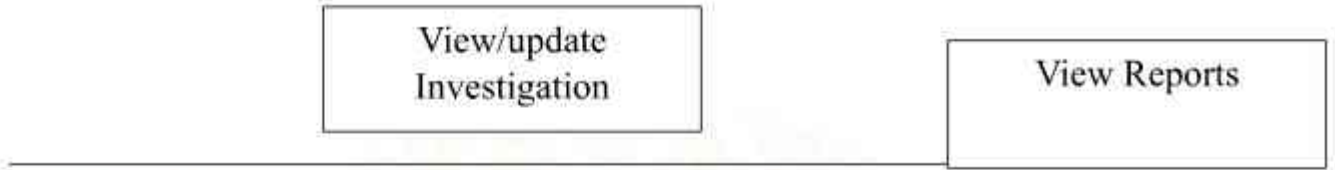


Fig 10. Police Complaint Management System.



11 USE HEALTH RECORD IN POLICE INVESTIGATION

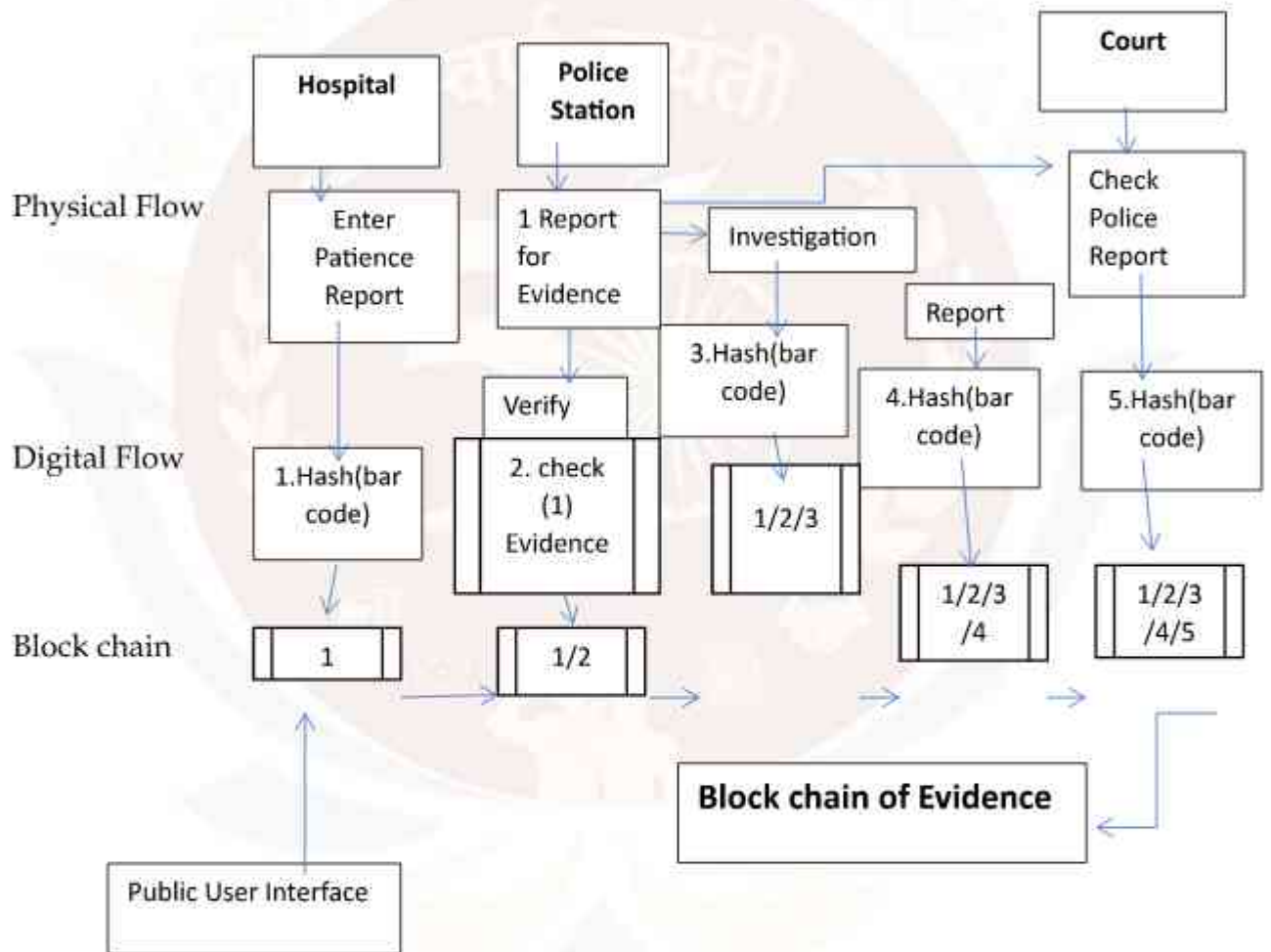


Fig.11. Use Health Record in Investigation

12 BLOCKCHAIN APPROACH FOR TRACKING GLOBAL CRIMINALS

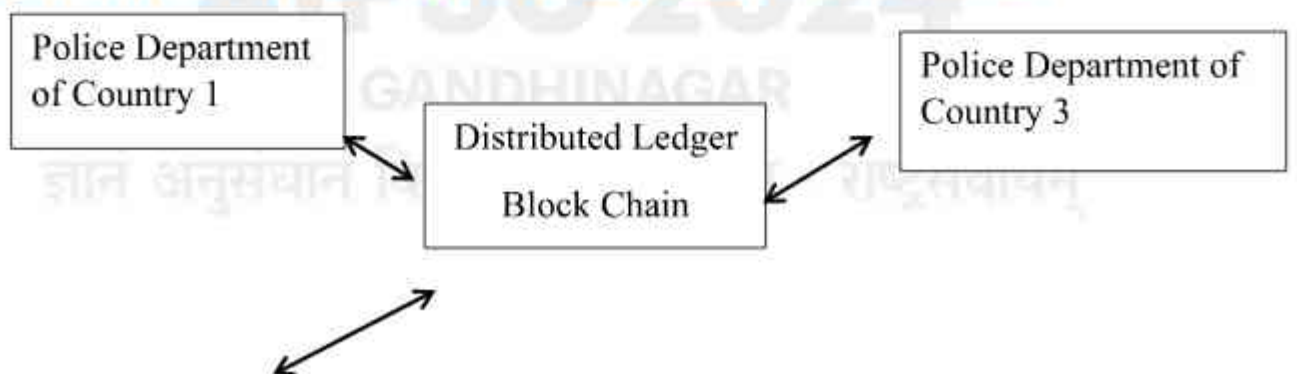




Fig.12. (A) Block chain based approach for tracking Global criminals

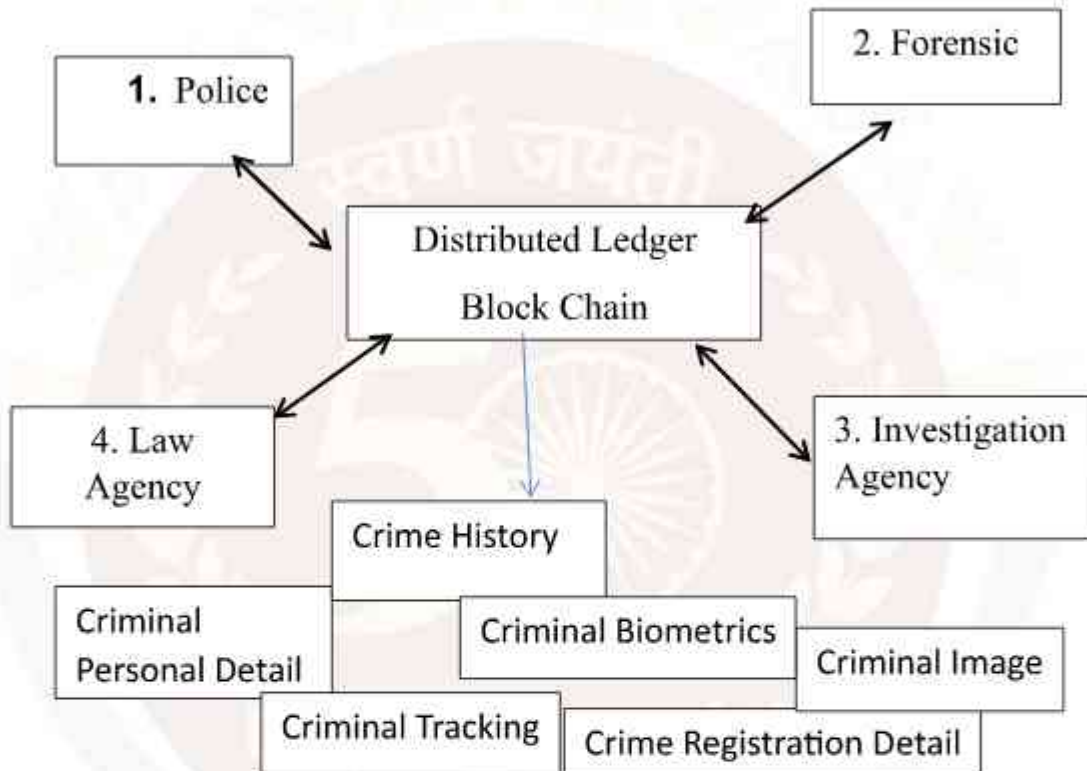


Fig.12.(B) Global Database of the distributed ledger of Blockchain

CHALLENGES

- **Privacy Concerns:** While blockchain offers transparency, the openness and public nature of the distributed ledger raises privacy concerns, the transaction details are visible to everyone connected in this chain.
- **Legal Proceeding and Regulatory Challenges:** It is difficult to regulate new technology Blockchain it requires a large infrastructure. When any kind of sensitive information is leaked it will create legal challenges as well.
- **Nodes-related Challenges:** The biggest challenge in using blockchain technology in policing can be the challenge related to nodes (Computers). Because this technology consists of multiple nodes that maintain the details of the ledger of transactions. But there are no rules or laws to help these nodes in the work/investigations of the police. So, they may or may not help the police in their investigation.
- **Challenges related to smart contracts:** In this technology, some such programs are also used that automatically execute the action on fulfilling certain

conditions. This means that if the criminal comes to know about the certain conditions of any programs in any way, then he can commit to exploit it.

CONCLUSION

When we think about these questions, we come to the conclusion that the future of blockchain technology is promising, with the potential to revolutionize various sectors, including law enforcement. Its enhanced security, transparency, and efficiency can help prevent and detect fraud, improve evidence handling, facilitate secure communication, combat cybercrime, and protect intellectual property.

For law enforcement agencies, understanding and leveraging blockchain technology will be crucial in staying ahead of criminals and ensuring the integrity of their operations. As technology continues to evolve, it will be essential for law enforcement to remain adaptable and proactive in embracing these innovations. The integration of blockchain into law enforcement practices not only enhances security and efficiency but also builds public trust in the legal system, ultimately contributing to a safer and more just society.

About the Author

The author is an Assistant Commandant with the 191 Battalion of the Central Reserve Police Force (CRPF).

AIPSC 2024

GANDHINAGAR

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THEME 5:

CHALLENGES IN TRACING MONEY TRAIL IN CYBER FRAUD AND WAY FORWARD



CHALLENGES IN TRACING MONEY TRAIL IN CYBER FRAUDS AND WAY FORWARD

Praween Prakash IPS

Tracing money in cybercrime poses significant challenges due to the complex and anonymous nature of online transactions. The advent of new technologies like cryptocurrency, virtual private networks (VPN), high-end encryption, the dark web, and the rapid increase in the speed of the transaction has made the process of investigation and tracing of money even more difficult. These technologies and their byproducts like decentralized finance (DeFi), Non-fungible tokens (NFT), Peer to peer networks (P2P) have added a new dimension to the traditional money laundering mechanism employed for hiding the source of funds and making the transaction path untraceable. There are many other such means that cyber criminals use that make the job of an investigator daunting.

INTRICATE AND SOPHISTICATED MONEY LAUNDERING PROCESS

The traditional money laundering process involves three steps namely placement, layering, and integration. The proceeds of the crime generated by cyber criminals also go through the same process thus obfuscating the origin of the fund and linking it to an individual or an entity is very difficult.

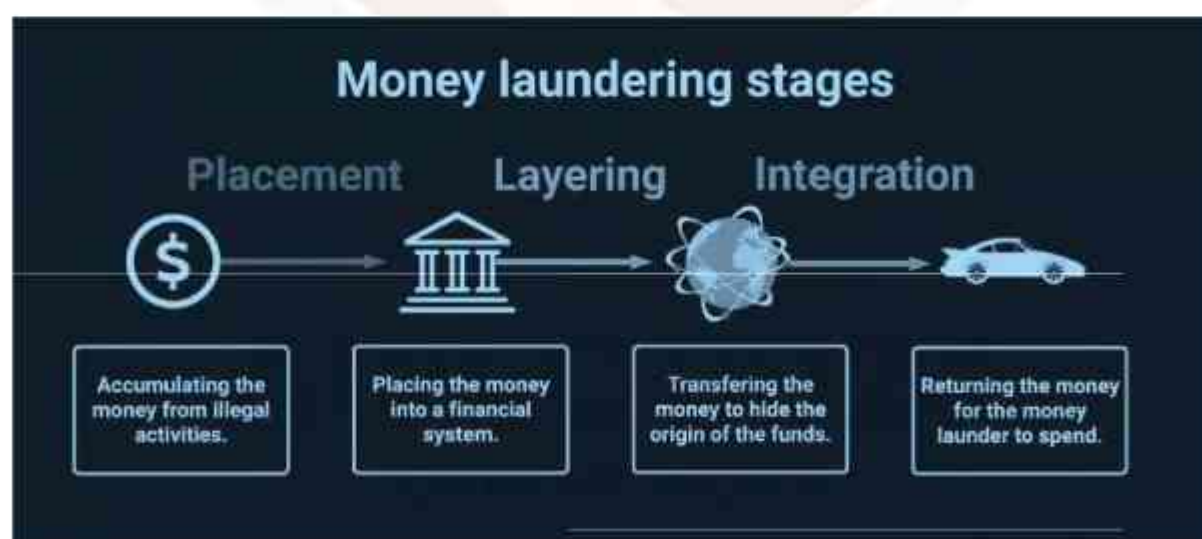


Figure 1: Steps involved in money laundering process

In recent years, the rapid growth of financial technology (fintech) and digital financial services in India has provided new avenues for innovation and inclusion. However, these advancements have also opened up potential avenues for money laundering. Prepaid payment instruments (PPIs), including digital wallets and prepaid cards, are popular in India for making payments without needing a bank account. These instruments, especially those with high limits and fewer KYC requirements, are being used to transfer illicit funds anonymously. This anonymity extends to cross-border transactions also, as prepaid cards facilitate international money transfers without the same level of scrutiny as traditional banking methods. This makes the task of the investigator even more difficult since getting details from international agencies by state police is time and many times requests are rejected. The state police also rarely have any recourse against their refusal.

Using above mentioned instruments and services multiple low-value transactions can be used to layer funds, making it harder for authorities to trace funds. This technique of generating low-volume multiple transactions is called "smurfing". The ease with which these digital wallets help create payment orders and transactions in a short span of time helps cyber criminals immensely to do smurfing. The investigator in this manner gets bogged down in the sea of transactions to trace the fund. With the lack of advanced tools to do such high-volume data analysis the outcome of investigation is affected.

Popular digital wallets like Paytm, PhonePe, GPay, MobiKwik, etc are widely used, and while they have implemented KYC processes, ease in setting up accounts and the possibility of using multiple wallets is being exploited for this purpose by cybercriminals.

Cybercriminals use money mules to open accounts on these platforms. They use them to open regular bank accounts as well. Money mules give their identity in lieu of some money to the cybercriminals and using these identities fake bank accounts and SIM cards are issued. The ill-gotten proceeds from the operation are transferred to accounts belonging to such hired mules, who are recruited from social media platforms, the prominent being Telegram in return for commissions or a lumpsum amount. The use of such messaging platforms poses a new challenge for investigators to trace cyber criminals and their networks. It is discussed in subsequent paragraphs.

The use of mule accounts is so extensive that an ecosystem of cybercriminals providing money mule services has developed. Starting at the village/small town level they have developed a hierarchical level of operators in this business. They use modern software and services to aid in the process of money laundering. In many cases, these networks run a worldwide network with a well-defined hierarchy. Due to

the encryption and privacy of these software and trans-border operations, again the job of the investigator becomes complex. A few such cases handled are mentioned for highlighting the above-mentioned points.

Case 1: The mastermind of a money mule network (Indian National) operated the network from Dubai. He had an IT set up in India where a high end GSM module with a web interface was set up. Fake SIM cards obtained through money mules were inserted in the GSM gateway ports and OTP generated were accessed remotely to transfer and layer money in multiple accounts as discussed above. The picture of GSM gateway ports and the web interface is shown below:



Figure 2: GSM Gateway

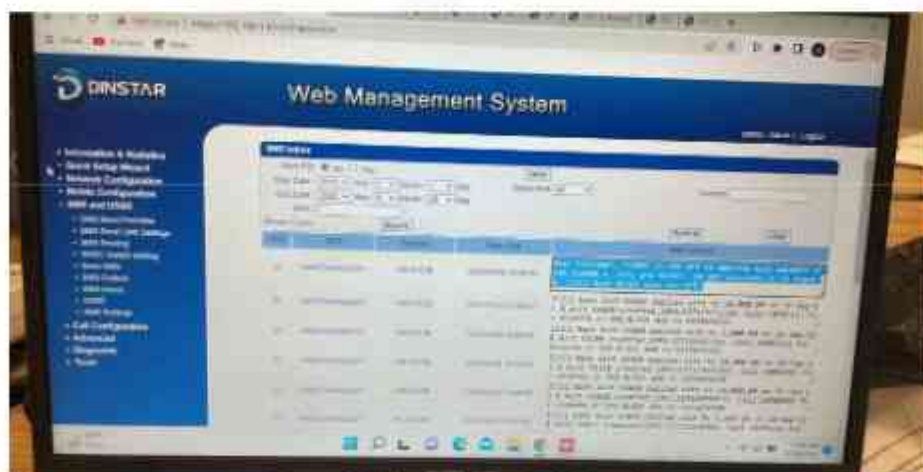


Figure 3: Web Interface for OTP reading

Case 2: An accused was arrested who had multiple mobile phones with him and these mobile phones had a sophisticated hidden app running as a service that was automatically forwarding the OTP received on the device to a Chinese server, thus eliminating continuous human interface. The server being located in China, it was almost impossible to get the details of the accused to whom the money was going.

Hawala transactions and shell companies are two other methods frequently exploited by cybercriminals to launder money and facilitate illegal activities. Hawala transactions facilitate anonymity, cross-border, and fast transaction settlement. Shell companies provide a layer of anonymity and legal complications for law enforcers due to transnational activities.

EMERGING TECHNOLOGIES

CRYPTOCURRENCY, NON-FUNGIBLE TOKENS (NFT) AND DECENTRALIZED FINANCE

Cryptocurrency is a digital asset whose transaction is recorded on the blockchain. These records are immutable and are stored on decentralized blockchains in a transparent manner.

Cryptocurrency has become a favoured tool for money laundering due to its unique characteristics that appeal to cyber criminals looking to move illicit funds with a lower risk of detection. And, exactly because of these characteristics only the investigation involving cryptocurrency becomes a formidable task for the investigating officer. A few such unique characteristics of why it has been favoured is mentioned below:

1) ANONYMITY AND PSEUDONYMITY

1. **Pseudonymous Transactions:** Although cryptocurrency transactions are recorded on a public ledger (blockchain), the identities of the individuals involved are not directly linked to the transactions. Instead, users are identified by alphanumeric addresses, making it difficult to trace the funds back to specific individuals. The users can only be identified if they have transacted through KYC (Know your customer) and AML (Anti-money laundering) compliant cryptocurrency exchanges. Regulation of exchanges again varies significantly from country to country thus impeding the investigation to trace the origin of money and the accused.
2. **Privacy Coins:** Certain cryptocurrencies, like Monero, Zcash, and Dash, offer enhanced privacy features that obscure transaction details such as the sender, receiver, and amount. This makes it even harder for law enforcement to track the flow of illicit funds.

3. **Mixers:** Cryptocurrency mixers, also known as tumblers, are tools and services used to obscure the origin of digital assets, making them a popular method for money laundering. Cryptocurrency mixers mix a user's cryptocurrency with other users' cryptocurrency to obscure the transaction trail. This process strives to make it challenging for external observers and law enforcement authorities to identify the specific senders or recipients of a transaction. Anonymix, Blender, Mixer. Money, Sinbad.io, Kilos Krumble, Cryptomixer, UniJoin are a few mixer services.
4. **Peer to Peer (P2P) exchange:** There are many platforms worldwide that facilitate P2P lending of cryptocurrency. Such platforms also facilitate P2P exchange of gift cards and other financial products in lieu of cryptocurrency. The KYC process on these platforms is lax and is often used by criminals to monetize their ill-gotten cryptocurrency. Paxful.com, symlix.com, coincola.com, bitpapa.com, localcoinswap.com, etc are examples of a few such platforms. Most of them operate from outside India and hence it becomes challenging to get the customer data from them.

2) EASE OF CROSS-BORDER TRANSFERS AND FASTER TRANSACTIONS

- 1) **Global Accessibility:** Cryptocurrencies can be transferred across borders without the need for traditional financial intermediaries like banks. This ease of movement allows criminals to quickly and efficiently move money across jurisdictions, complicating efforts to trace and recover illicit funds.
- 2) **Lack of Regulation:** Some countries have lax regulations regarding cryptocurrency, making them attractive destinations for laundering money. Criminals exploit these regulatory gaps to move funds to jurisdictions where law enforcement oversight is weak.

3) IRREVERSIBLE AND FAST TRANSACTIONS

1. **No Chargebacks:** Once a cryptocurrency transaction is confirmed, it cannot be reversed. This irreversibility is advantageous for criminals, as it reduces the risk of authorities reclaiming laundered funds after transfer to their non-custodial wallet not held by any exchange. Even if the amount is handled by any cryptocurrency exchange, the regulation makes it very difficult to reclaim the amount.
2. **Rapid transaction:** Transactions in cryptocurrency are very fast and do not take much time like settlement of payments through traditional banking systems. This

helps criminals immensely in creating large volumes of transactions in a short span of time even transferring it across borders allowing criminals to move money rapidly before law enforcement can detect or intervene.

Apart from these, cryptocurrencies are the primary medium of exchanges on dark web markets which facilitate the conversion of cryptocurrency into other assets. Cryptocurrencies are also the primary mode of payment in ransomware attacks because of the anonymity and protection it offers to cybercriminals.

There are thousands of cryptocurrencies on the various blockchains and criminals often convert one cryptocurrency to another using various swapping services available as DeFi services. Tracing the fund over multiple blockchain networks creates another level of complexity. A list of all cryptocurrencies can be found on <https://coinmarketcap.com/all/views/all/>

Non-Fungible Tokens (NFTs) and Decentralized Finance (DeFi) are two emerging areas in the cryptocurrency space that, while offering innovative financial opportunities like fintech products, have also become potential tools for money laundering due to their unique characteristics. NFTs are digital assets representing ownership of unique items, such as artwork, music, or virtual real estate, stored on a blockchain. DeFi refers to a set of financial services provided through decentralized applications (DApps) on blockchain networks. These services include lending, borrowing, trading, and investing, all without traditional financial intermediaries. NFT's and DeFi's decentralized and often anonymous nature like cryptocurrency makes it a fertile ground for money laundering.

Case 3: During the investigation of a case the Ethereum address 0x72f265aaeb050d3d5abd620a1762d2182089d... (last three characters truncated) came out to be related to the accused involved in a multi-crore cyber fraud. This address transacted with thousands of addresses as revealed in the transaction history given by the Binance exchange. Most of these addresses were not attached to any exchange and among those attached to exchanges, many of them were not KYC-compliant exchanges and were operating from outside India. Thus, adding one layer of complexity.

Secondly, this address dealt in multiple crypto assets like ADA (cardano), BNB, SOLO (Sologenic), BTC(bitcoin), TRX(Tron), USDT(TetherUS), XRP(Ripple), SOL(Solana), UNI(Uniswap), THETA(Theta token) over multiple chains and in a few DeFi tokens, adding a second layer of complexity.

The transactions from and to this address were very high in volume and count creating a sea of transactions thus creating another barrier in tracing the money. The flow of funds of a small section of such transactions is attached below:

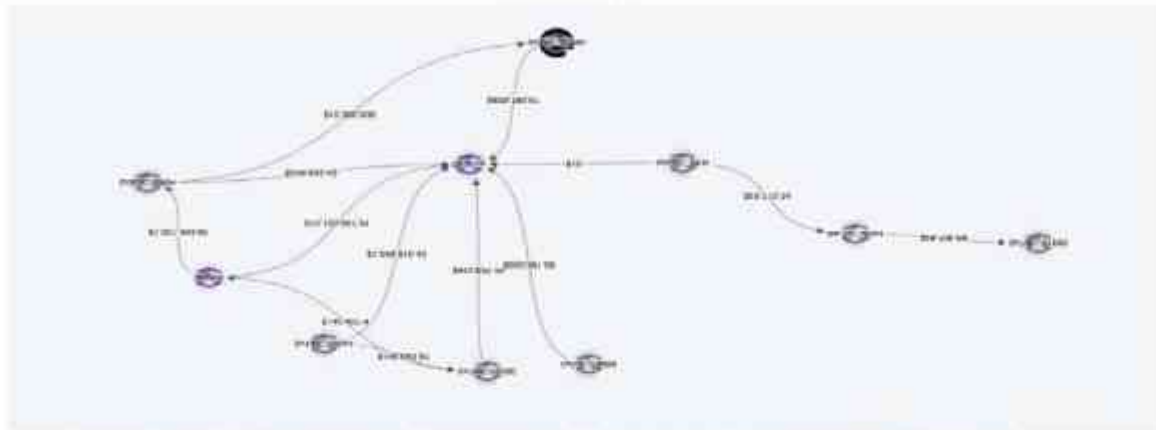


Figure 4: Small part of flow of cryptocurrency of an accused's crypto address

PRIVACY TECHNOLOGIES

1. END-TO-END ENCRYPTION AND RESTRICTED DATA SHARING

Many messaging, email, and social media platforms like Telegram, Signal, protonmail, mailfence, hushmail, signa and others use end-to-end encryption and strict privacy policies, which have been exploited by the cybercriminals. These platforms allow criminals to communicate securely, making it difficult for law enforcement to trace their activities. They also create a lot of channels to deceive gullible people. The global nature of these platforms further complicates investigations due to varying legal frameworks across countries. The platforms' policies on cooperation with law enforcement, often limiting access to user data, makes it even more challenging.

2. VPN (VIRTUAL PRIVATE NETWORKS) AND TOR (THE ONION ROUTER) NETWORK

Criminals exploit TOR and VPNs to ensure their anonymity and privacy. TOR allows users to route their internet traffic through multiple encrypted layers and volunteer-operated servers, making it nearly impossible to trace their real IP addresses.

VPNs add another layer of security by masking the user's IP address and routing their internet traffic through servers in different locations. This makes it challenging for law enforcement authorities to trace the activity back to the user's physical location. Some criminals use multi-hop VPNs, which route traffic through several servers in different countries, adding extra layers of anonymity.

When TOR and VPNs are used together, the level of anonymity and security is significantly enhanced, making it extremely difficult for authorities to track and trace illegal activities.

During the investigation of financial fraud when the IP log provided by the bank attached to an account is received, it shows multiple international locations. This makes it almost impossible to identify the actual perpetrators through their locations.

1. JURISDICTIONAL ISSUES AND INVOLVEMENT OF MULTIPLE STAKEHOLDERS COLLABORATIVE NETWORK OF CYBER CRIMINALS

The global nature of cybercrime makes it challenging for law enforcement to track funds within criminal networks. Cybercriminals often operate across multiple countries, each with its own laws, data privacy regulations, and levels of international cooperation. This creates a complex web of legal obstacles, making it difficult for law enforcement agencies. Differences in legal systems, procedures, and priorities can hinder investigations, allowing criminals to move funds through various channels undetected. Cybercriminals exploit these jurisdictional gaps by using intermediaries, shell companies, and layered transactions to obscure the trail of illicit funds. The involvement of multiple stakeholders, such as financial institutions and digital platforms, further complicates the situation. While some institutions may cooperate with law enforcement, others may not due to local laws or reputational concerns. The decentralized nature of cybercrime networks, combined with advanced technologies like encryption and VPNs as mentioned earlier, makes it difficult for law enforcement to track funds and prosecute cybercriminals.

During the investigation of many cyber frauds, IP addresses pointing to servers located in China and other non-friendly countries have been found. The investigation comes to a dead end in such cases until and unless these gangs of cyber criminals have a contact or a base in India.

OTHER TECHNICAL ISSUES

o Lack of technical expertise and tools

The lack of technical expertise and advanced tools significantly hampers law enforcement's ability to trace money in cybercrime cases. Cybercriminals often use sophisticated technologies, such as encryption, blockchain, and anonymization networks like TOR as discussed in preceding paragraphs, to conceal their activities and make their financial transactions virtually untraceable. Without the necessary technical expertise, law enforcement agencies struggle to penetrate these layers of obfuscation. Many agencies lack skilled personnel who are trained in digital forensics, blockchain analysis, and advanced cybersecurity techniques, leaving them ill equipped to deal with the complexity of modern cybercrimes.

For example, analyzing bank statements to trace funds in cybercrime cases presents several difficulties. A single bank statement can contain an overwhelming amount of data. Cybercrime investigation involves hundreds and thousands of accounts and thus financial data grows enormously as the investigation proceeds. The involvement of multiple banks creates a challenge of account statements varying widely in format and level of detail. The short summary of transactions in bank statements also varies from bank to bank. With these complexities, it is extremely difficult for investigators to piece together the complete financial picture if done manually. However, there are a few automated tools available, but all of them have some limitations. So, this is one of the biggest hurdles that needs immediate addressing so that the investigating officer can bring actionable leads in a short span of time.

Again, the investigation of cryptocurrency cases requires sophisticated and automated tools. Investigating officers need extensive training to use these tools. Many investigators lack a comprehensive understanding of blockchain technology and cryptocurrency, which hinders their ability to conduct effective investigations. Further, it is also pertinent to mention that cryptocurrency analysis tools such as Chainalysis, TRMLabs, Elliptic, CypherTrace etc are extremely expensive and that creates a barrier in the investigation involving cryptocurrencies.

○ **Legal issues in data sharing from outside India**

Obtaining data from outside India for cybercrime investigations involves significant challenges due to jurisdictional issues, differing data privacy laws, and complex procedures like Letter Rogatory (LR), which can be slow and cumbersome. Cybercrime investigation is time sensitive investigation and any inordinate delay adversely impacts the outcome. Many cases are seen lying pending for want of data from foreign entities.

Also, many big multinational companies are often in data denial mode and they measure the sensitivity of the matter under investigation as per their yardstick which might not be suitable if applied to the Indian context. They either do not provide data or even if they provide, they take a long time in many cases. This seriously hampers the investigation.

○ **Delay by various financial intermediaries and other stakeholders**

Delays by financial intermediaries, digital platforms, online marketplaces, and others in sharing data critically impede the tracing of funds in cybercrime cases, allowing funds to be moved or laundered before authorities can act. These intermediaries often do not recognize the urgency of the information needed. As an example, the non-availability of even a single bank statement in a complex transaction chain involving multiple bank accounts can halt the entire investigation. Therefore, strict policies and compliance deadlines are essential to address these challenges effectively.

CONCLUSION

In conclusion, tracing money in cybercrime presents a myriad of challenges that can significantly hinder the effectiveness of investigations. The complexity arises from the dynamic and borderless nature of cybercrimes, coupled with jurisdictional issues, varying data privacy laws, the technical hurdles of tracking rapidly moving funds, and use of new technologies. Delays by financial intermediaries in sharing critical data further exacerbate these difficulties. The skill upgradation of the investigating officers is also the need of the hour. The interplay of these factors underscores the need for enhanced international cooperation, streamlined legal processes, and more robust data-sharing mechanisms to improve the efficiency and success of tracing efforts in the fight against cybercrime.

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About the Author

The author is the Superintendent of Police Darjeeling, West Bengal with prior experience as the Deputy Commissioner of Police for Cyber Crime in Kolkata.

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CHALLENGES IN TRACING MONEY TRAILS IN CYBER FRAUDS & THE WAY FORWARD

Jayanta Dubey

ABSTRACT

Cyberfinancial fraud is one of the most significant financial crimes affecting individuals, businesses, and governments. Tracing the money trail in such crimes is becoming increasingly difficult due to evolving technologies, decentralized currencies, and the international nature of cyber fraud networks. This paper explores the primary challenges faced by law enforcement and financial institutions in tracking money trails in cyber fraud cases and proposes strategic recommendations and solutions to overcome these obstacles.

DIFFERENT TYPES OF CYBER FINANCIAL CRIMES IN INDIA

Cyber financial crimes are illegal activities involving financial fraud or manipulation facilitated through digital platforms and cyberspace. These crimes leverage the speed, convenience, and anonymity provided by modern digital technologies to defraud individuals, businesses, and governments. Below is a detailed exploration of different types of cyber financial crimes:

1. PHISHING

Phishing is a cybercrime where attackers impersonate legitimate organizations to trick individuals into revealing personal or financial information such as passwords, credit card numbers, or bank details. Attackers often use emails, social media messages, or fake websites to lure victims.

- Phishing involves sending bulk emails to multiple targets, hoping that a few will fall victim.

Examples:

- Receiving a malicious email that seems to be from a bank or a Financial Institution or a legitimate company, asking the receiver to click a link to update their account details, or update any personal details which leads to a malicious website designed to steal credentials.

2. CREDIT CARD FRAUD

Credit card fraud refers to the unauthorized use of someone's credit or debit card details such as Card Number, and CVV Number to make transactions or withdraw money. In

cybercrime, Cyber criminals often steal card data through hacking e-commerce websites, phishing, or skimming devices.

Examples:

- A criminal gains access to a cardholder's database and steals customers' credit card vital details, then uses them to make unauthorized purchases often through remote access of a customer's mobile phone.

3. IDENTITY THEFT

Identity theft occurs when a cybercriminal steals someone's personal information, such as their Mobile Number, Adhaar Number, name, address, banking details, and fingerprints, and uses it to commit fraud. This can lead to financial crimes such as opening new credit accounts, taking out loans, or making unauthorized transactions through UPI & AePS.

Examples:

- A criminal obtains an individual's sensitive information through phishing or a data breach and applies for credit cards or loans in their name, or uses their Bank account as Mule for layering.

4. INVESTMENT FRAUD AND PONZI SCHEMES

Investment fraud in cybercrime occurs when fraudsters promote fake investment opportunities online, promising high returns with little risk. Ponzi schemes are investment fraud where returns for earlier investors are paid with the capital of newer investors, eventually collapsing when the scheme runs out of recruits.

Examples:

- A fake website promotes a high-return investment in a new tech company, luring victims into investing large sums, only for the company to disappear. (Assam Ponzi scam is a recent example)

5. MONEY MULE SCHEMES

A money mule is any individual who either knowingly or unknowingly transfers illegally acquired money on behalf of others or parks illegally acquired money in their accounts. In cybercrime, money mules often receive funds stolen from fraud victims and are asked to forward the funds to criminals, usually in exchange for a commission. Many money mules are unaware that they are engaging in illegal activity and Money Laundering.

Examples:

- A person receives a job offer to “work from home” by transferring funds between bank accounts. In reality, they are laundering money for cybercriminals.

6. TASK FRAUD SCHEMES

Task fraud typically involves the promise of easy money for completing online tasks, such as filling out surveys, data entry, reshipping products, liking & Subscribing YouTube channels, Giving Brand Reviews or even transferring funds. Victims are lured with promises of high pay and flexible work arrangements. However, these tasks are either fraudulent or linked to illegal activities, leaving the victims either unpaid or implicated in criminal schemes.

COMMON TYPES OF TASK-BASED FRAUD IN INDIA

1. **Fake Work-From-Home Jobs:** Fraudsters post job ads on social media mainly WhatsApp and Telegram App or job portals offering remote work with high pay & Demands Registration Money Through UPI. Victims are asked to perform tasks such as filling out forms, completing surveys, or typing documents, but after completing the tasks, they are not compensated and Their remuneration is Stuck in so-called e-wallets provided by Fraudsters.
2. **Reshipping Fraud:** Victims are recruited to receive and reship packages, often unknowingly becoming part of a scam that involves handling stolen goods. Fraudsters present this as a logistics or shipping job where victims are asked to forward products to international addresses.

TASK BASED SCAM - A CASE STUDY APPROACH TO CHALLENGES IN TRACING MONEY TRAILS IN CYBER FRAUDS

- Dossier In C/w Ambassa PS Case Number-2023ABS063 Dated-30/11/2023 U/S-420/120B of IPC & U/S-66C & 66D Of IT Act
 - P.O(Place of occurrence): At Pally Bangla Resort, Anandpur, Kolkata
 - D.O(date of occurrence): On 3rd & 4th November 2023 and 6th to 9th November at several times.
 - D.R(Date of Registration): On 30/11/2023 at 1935 hrs.
 - Complainant: Insp Gobinda Das of Ambassa PS, Dhalai, Tripura.
 - FIR Named Accused:
- I. Tushar Kumar (27) S/o Shri Sudhir Kumar of Chero, Bihar Sarif, Dist. Nalanda, State-Bihar

II. Kartik Debnath (30) S/o Shri Ananta Debnath Of village- Chandrai Cherra, PS-Ambassa, Dhalai Tripura

III. Harilal Das (30) S/o Shri Harala Das Of Dulubari, PS Ambassa, Dhalai Tripura

I/O: Jayanta Dubey, DySP (Prob) of Office of SP Dhalai

All the Three FIR Named A/P are in Judicial Custody Vide Order Sheet Dated 05/12/2023 of Ld. Court of CJM, Dhalai Judicial District.

Person Arrested in C/w the case as on Date:

- 1) Tushar Kumar
- 2) Rajdeep Das (Involved accused)
- 3) Kartik Debnath
- 4) Harilal Das

KEY FACTS OF THE CASE

1. Kartik Debnath is a Business correspondent in PNB (Punjab Bank) Shikaribari Branch of Ambassa and was engaged in offering Loan to Micro & Medium businessman, opening Bank account for them, offering withdrawal Facility through A-eps (Adhar enabled payment system) which in turn entitled him to collect huge customer Data such as PAN, Adhaar Number, Bank Account Number, Mobile Number, Debit Card, etc.
2. Kartik Debnath then convinced two Businessmen named Supriti shill (Owner of Joyram Hotel) and Pradip Acharjee (owner of the sweet shop) Both of Ambassa, to open a Current Account in ICICI Ambassa Branch and in connivance with Branch official of ICICI Ambassa Branch enhanced the Transaction limit to 5 crores per Day in above bank accounts.
3. Kartik Debnath Then, took all the Debit Card, CVV No, Sim Linked with Bank A/C, of Both Supriti Shil & Pradip Acharjee on the pretext of offering them a Loan and gave the Details to Rajdeep Das of Ambassa.
4. Rajdeep Das & Kartik Debnath after taking all vital Bank Details Strike a Deal in lieu of Commission with Sourav Kar (of Kolkata), Raju Sarkar (of Kolkata) & Rohit Khan (of Kolkata) to use this Current account in collecting Fraudulent money from across the country through conning people in Task Fraud, investment scheme, fake links of shopping, Flight booking, etc. All the payments were collected by online UPI Payment, QR-based Payment, in above referred account.
5. Rajdeep Das & Kartik Debnath went to Kolkata on 6th November 2023, and stayed at

Pally Bangla Resort, Anandpur, Kolkata, till 9th November and there along with Sourav Kar, Raju Sarkar, & Rohit Khan opened internet banking of both Current Account, Activated E-sim of Both Account Holder, and shared the Login ID & Password details with alleged Chinese person on telegram and what's app. There after Huge sum of Money was Deposited from both the accounts of Supriti Shill and Pradip Acharjee (4 crores approx.) and immediately went out through multiple mule accounts ultimately leading to the purchase of USDT (Cryptocurrency) a Chinese cryptocurrency and some amounts were also withdrawn in Dubai UAE.

6. Tushar Kumar (of Nalanda Bihar) is one such person who being a member of This task Fraud gang and operate his racket on telegram app via fake account name and con people in the name of offering job etc How he came in Agartala to demand Money share is yet to be established. Was he the alleged Chinese person who used fake image of Chinses citizen and operated and instructed the duo Rajdeep and Kartik on telegram app is yet to be established as the Mobile exhibits are still in SFSL pending examination. He arrived at Agartala on 28th November 2023 and was striking a share in proceeds of commission with Rajdeep Das, Harilal Das, & Kartik Debnath and a scuffle broke out which led to the lodging of the instant case.
7. Huge incriminating evidence is there in all the Mobile Phones seized in c/w the case and were sent to SFSL for Data Retrieval, Call Logs, chat retrieval, Network logs, images, APK files, etc. Legal Notices were issued to social networking sites.
8. In total 55 complaints / FIRs have been lodged across the country against the Bank Accounts of Harilal Das, Supriti Shill, & Pradip Achar Jee, and almost all the complaints were lodged on NCRP Portal (cybercrime.gov.in) The cases were given to respective states for further actions. All the IOs of respective states coordinated through I4C (Indian Cybercrime Coordination Centre) an initiative of MHA, GOI to investigate the cases. It is one of the best smart policing initiatives appreciated Worldwide to tackle cyber financial crimes.
9. This case is fit for adding sections of Money laundering under PMLA 2002 and can be investigated through that dimension also.

CHALLENGES FACED BY INVESTIGATING OFFICER IN TRACING THE MONEY TRAIL

The tracing of the money trail in cybercrimes, especially in India, faces several challenges. Here are some key challenges faced by the IOs during the investigation of cyber financial crime:

1. **Gathering the Data of a Suspect Bank account:** A cyber financial crime complaint is lodged either in PS or in the NCRP Portal or through the 1930 Helpline number. If the complaint is lodged in PS the Registering officer endorses the case to Io for investigation of the case, now, in this case, it is up to the IO to coordinate with multiple agencies such as banks, I4C, Social Media intermediaries, etc to gather the information of suspect bank account and layered accounts involved in the offence which is time-consuming and cumbersome leading to loss of golden hour. If the complaint is lodged directly on NCRP Portal then with the help of CFCFRMS (Citizen financial cyber fraud reporting management system) quick decisive and system-based effective action is taken to prevent the flow of money siphoned off from innocent citizens to the fraudsters. It is a common integrated platform where all concerned stakeholders i.e., Law Enforcement Agencies (LEAs), banks, RBI, financial intermediaries, payment wallets, NPCI, etc., work in tandem. Citizen Financial Cyber Frauds Reporting and Management System has been developed for quick reporting of financial cyber frauds and monetary losses suffered due to the use of digital banking/ credit/ debit cards, payment intermediaries, UPI etc.
2. **Layering:** Layering in financial cybercrime refers to the process where criminals use multiple, complex transactions to obscure the origin of illicit funds. The process of layering is used extensively in cybercrimes to complicate the tracking of funds, involving complex banking networks and digital transactions. For example, in a typical Task-based scam money of a single victim will be routed to the fraudster through 8 to 10 different bank accounts and finally, it will be withdrawn in different countries in most cases. This frustrates the investigation agency and by the time the IOs navigate these challenges, the fund will be withdrawn, the Account will be dormant and the person responsible will be out of reach of the Rule of law.
3. **Delay in filing complaints:** Delays in reporting cyber incidents may result in a lack of action by the agency during the golden hour. These delays can allow criminals to move or conceal funds, leading to significant financial losses for victims. Swift complaint filing is critical to minimizing these delays and ensuring the recovery of funds.
4. **Anonymity in Decentralized Applications:** Cybercriminals often exploit decentralized apps, making it difficult to track digital footprints and follow the money trail. This is exacerbated by the anonymity these platforms provide. For example, Telegram App which even after repeated legal notice didn't comply with it.

5. **Technical Hurdles:** There are technical challenges in deterring and punishing cyber criminals. Tracing the origin of funds and following the electronic trail is often impeded by technological limitations and the complexity of international financial systems. VPN and proxy IPs were used in the instant case and multiple notices need to be served to find the real culprit.
6. **Impact of Cybercrime:** Cybercrime in India is growing due to the increasing digital economy, and lack of financial literacy among the masses but the existing mechanisms to track money trails are often underdeveloped. Investigations are further complicated by the use of virtual currencies such as USDT Binance coins.
7. **Cybercrime in Banking:** The Indian banking sector, heavily reliant on digital technologies, faces significant risks from Data theft of customers and manipulation by persons who are opening accounts for the sake of being Money Mules. This aspect is arising due to non-compliance with strict KYC Norms as mandated by RBI.
8. **Legal Hurdles:** There is a lack of fast-track courts to address such cybercrime cases, even the existing punishment in penal laws is not acting as a serious deterrent on cyber criminals, and law enforcement agencies often struggle with cross-border coordination to trace illicit financial flows. One of the biggest challenges is the varying regulations these intermediaries operate under. They adhere to the laws of the countries where they are headquartered, not Indian laws. While some platforms, such as social media and messaging apps, are more cooperative, VPN service providers pose a much greater challenge. Their primary selling point is user anonymity and privacy, which often brings our investigations to a standstill. These companies provide only limited information, citing their own country's privacy laws, and when we request more, we are advised to go through Interpol – a process that can take months, losing valuable time in the investigation.
9. **Money Mules and Financial Crimes:** The involvement of money mules – intermediaries who transfer stolen money – adds complexity to tracing cybercriminals. The money is often laundered through multiple channels, making it hard to pinpoint the original source.
10. **Anonymity & Privacy Laws of Intermediaries:** The most challenging aspect is dealing with internet intermediaries. Their cooperation is often crucial to unmasking cybercriminals, but it's a hurdle we frequently encounter. Most cyber rackets we uncover lead to the arrest of only the lowest-level operators, while the masterminds remain hidden behind layers of VPNs or operate from abroad, making them harder to track. For instance, in recent fake investment schemes and work-

from-home scams, the key perpetrators are believed to be based in Gulf countries. Despite leads, we could not identify them fully. We depend heavily on internet intermediaries to provide critical information, but this is where we often hit a dead end. Not a single case, to my knowledge, has seen an individual extradited to India in connection with cybercrime, even when international involvement is evident. One case I recall involved hoax bomb threat emails sent to schools in 2022. While IP was traced to Pakistan and the information was shared with central agencies, no further progress was made.

CONCLUSION

The above challenges highlight the multifaceted dimensions in tracking financial transactions related to cybercrimes, such as technological, legal, and jurisdictional issues. Cyber financial crimes continue to evolve, becoming more sophisticated and difficult to detect as new technologies emerge. The anonymous and borderless nature of the internet provides criminals with unique opportunities to exploit vulnerabilities in individuals, businesses, and financial systems. The impact of these crimes is far-reaching, affecting both direct victims and the broader economy, requiring continuous improvement in cybersecurity measures, legal frameworks, and international cooperation to combat this growing threat.

WAY FORWARD

With the rise in cyber financial crimes, law enforcement agencies face increasing challenges in identifying and apprehending culprits, particularly due to technological anonymity and cross-border complications. However, recent initiatives under the Indian Cyber Crime Coordination Centre (I4C) offer a much-needed ray of hope. As an investigating officer involved in cybercrime investigations, leveraging these initiatives can significantly enhance the efficacy of probes and bring culprits to justice more swiftly. Here's a way forward, considering these new tools and initiatives. The following can be considered as the way forward in this direction:

1. New Criminal Law: Bhartiya Nyaya Sanhita 2023 which replaced the IPC of 1861, Defines 'organised crime' as a "continuous unlawful activity". Digital financial frauds are covered under this definition and can be treated as organised crime under BNS 2023, while BSA 2023 modernizes evidence collection, facilitating the prosecution of cyber criminals by integrating digital evidence laws. Together, they modernize India's legal framework for cybercrime

2. Cyber Commandos Program Launched Recently by Hon'ble Union HM: This initiative focuses on creating a special force of 5,000 trained "Cyber Commandos" to

support states, union territories (UTs), and central agencies. These commandos will be experts in cyber forensics, digital intelligence, and cybercrime investigations, offering invaluable assistance in combating complex cyber financial crimes.

3. Cyber Suspect Registry: The Suspect Registry is a centralized system that aggregates identifiers of known cyber criminals, built from data gathered through the National Cybercrime Reporting Portal (NCRP). It enables better fraud risk management in collaboration with banks and financial intermediaries. Officers can use this registry to cross-reference suspects and strengthen their investigations by connecting various cyber financial frauds to repeat offenders.

4. Cyber Financial Crime Fraud Reporting and Management System (CFCFRMS): This system is designed for real-time reporting and management of cyber financial frauds through the NCRP Portal. It brings together law enforcement agencies, financial intermediaries, and service providers to collaborate and act swiftly against cyber financial crimes. This platform ensures a coordinated response to rapidly evolving fraud tactics and prevents criminals from exploiting loopholes.

5. Pratibimb Portal: Launched to map and track mobile numbers involved in cybercrime activities, Pratibimb integrates Geographic Information System (GIS) technology to visually display the location of these numbers in real-time. This tool allows law enforcement agencies to identify cyber hotspots and act quickly. In several cases, Pratibimb has already helped track down cybercriminals changing locations frequently after police raids, leading to significant arrests and the dismantling of fraud networks.

6. Sanchar Saathi Initiative: The Sanchar Saathi platform helps track and block fake SIM cards, a common tool in cyber financial crimes. This initiative enables investigators to quickly identify and deactivate SIM cards used in fraudulent activities, disrupting communication networks essential for executing large-scale scams.

WAY FORWARD FOR INVESTIGATING OFFICERS

- **Collaborative Efforts:** Officers should utilize these initiatives in conjunction with traditional investigative methods. Collaboration with other states, the Joint Cybercrime Coordination Team (JCCCT), central agencies, and financial institutions via platforms like CFCFRMS of NCRP and various verticals of I4C and the Suspect Registry can provide a comprehensive approach to addressing cyber financial frauds.
- **Real-time Monitoring:** Using tools like Pratibimb, a Heat Map of Cybercrime

Hotspot can be identified and accordingly Targeted actions can be taken in coordination with JCCCT of respective states. Sanchar Saathi, officers can quickly respond to cybercriminal movements and activities, enabling targeted actions.

- **Leveraging Expertise:** Cyber Commandos bring a specialized skill set that can be employed in complex investigations, ensuring more sophisticated cybercriminals are apprehended effectively.

These initiatives form a multi-layered, technology-driven strategy to combat the evolving landscape of cyber financial crime, making the investigative process more streamlined and effective.

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AIPSC 2024

GANDHINAGAR

ज्ञानं अनुसंधानं विज्ञानं जनसुरक्षा च - राष्ट्रसेवार्थम्

AN ILLUSTRATIVE CASE STUDY: MONEY TRAIL OF ONLINE INVESTMENT SCAMS LEADING TO BANK/NBFC ACCOUNTS OF BENEFICIARIES WHO ARE ALSO VICTIMS IN THE SAME CYCLE OF EVENTS

Sourav Bhattacharjee

INTRODUCTION

The internet has ushered the era of w.w.w where the people of the world are virtually united the physical distance is reduced to almost nothing and the word virtual replaces the real. That virtually we thus are all connected in this world.wide. web the intricate expanse of the same has also juxtaposed our individual functions over one omnipresent general platform which can be accessed by anyone with a key of internet connection. The rigid geographical and geo-political divide is no more and the removal of the barriers was fully utilised by the financial institutions, in Indian banks in the late 1990s had evolved Core banking facilities, and the geographical transactional shortcomings of fund transfers and related processes and functions were obliterated. This made free flow of funds from one account to another.

The next Step Internet Banking: The banking system in India was further revolutionised with the advent of Internet banking facilities the proliferation of hand-held mobile phones with Internet connections in the populace placed the banking functions of one's bank account in the personal domain of a person, the hitherto rigid bank – customer interface was more or less obliterated. The advantages are huge, the people have no less time to get used to the system, the bank visits became a rarity however the access soon gave rise to the danger of compromise and the internet-linked bank accounts became prone to outsider attacks wherein cyber crooks found it must easier to siphon of hard-earned money of the account holders.

ONLINE CHAIN MARKETING/INVESTMENT PROCESS SCHEMES, A CURRENT TREND OF THE CYBERCRIMINALS TO SIPHON HARD EARNED MONEY OF THE GULLIBLE PUBLIC.

In addition to pilferage or the siphoning of money from the accounts of gullible account holders by various other methods, over the recent past various investment scams that are propagated and circulated online have surfaced wherein the victims are made to believe in rosy pictures of lucrative returns and are goaded into investing huge amounts with some unscrupulous persons/entities/companies, that however

these are rarely now being conducted on person to person/person to company/accused and victim singular interface but rather the offenders are employing the method of chain marketing concepts wherein the investors are fitted in a virtual loop with numerous other persons. The change in the operation procedure is made to increase the quantum of money in the system that will ultimately be defalcated through the offence.

THE METHOD AND THE PROCESS

The hybrid mode: The process is generally operated in a dual mode i.e. the perpetrators of the process do not carry on the operations entirely in the remote mode without physical interactions but generally adopt the hybrid mode where either the initial initiation /interaction and exchange of monies are executed out through online communications and some subsequent function related thereto are carried on in the physical meet up interface or vice versa.

These types of investing scams are generally referred to by various terminologies like:

- Pyramid Schemes
- Internet closed group schemes (Carried on through various social media platforms and messaging apps).
- App-based schemes in the likes of genuine trading apps.
- Mutual loan schemes (Agreeable profit sharing)
- Leader and member chain marketing schemes.
- Online trading assisted money multiplying schemes.
- Online product marketing and incentive schemes.
- Online investment in cryptocurrency/blockchain systems.

MODE OF FUNCTIONING AND BUILDUP

Generally, in these types of schemes whenever a new investor invests an amount, he/she is disbursed some returns in accordance with the promise however further down the line these investors are motivated to become partners or leaders in the money-making pyramid. The initial single investor then needs to recruit new investors under his leadership chain and thereby earn commissions based on the investments made by their recruits. The cycle repeats with the recruits concurrently and in this way the chain of people who become associated with the scam gets elongated and a base-heavy pyramidal structure is formed.

Thus, the primordial focus in these types of investment scams is on recruiting new members so that money flow continues and there is always some readily disburseable

money in the system. As the pyramid grows larger, it gets bloated with funds but shrinks and becomes unsustainable as soon as the number of old/existing investors vis-à-vis fresh joiners' trickles down negatively disturbing the equilibrium stable state, and the majority of participants end up losing their money.

DECODING THE MODUS OPERANDI ON BROAD PARAMETERS

1. Promise of astronomical returns on investments which is remotely untenable on normal financial operating processes.
2. Investors are encouraged to become so-called partners in the system once faith is built up by providing them with handsome initial returns.
3. Focus on recruiting new participants to build up a base-heavy team.
4. Emphasis on recruitment rather than genuine financial management.
5. The illusion of legitimacy with deceptive marketing techniques.
6. Participants earn commissions based on recruitment levels.
7. Reliance on continuous recruitment for sustainability.
8. The collapse of the entire system when recruitment slows down causes financial losses.
9. The sudden exit of the masterminds from the area and locality of the physical operational interface.
10. Eraser of digital footprints and complete blocking of all electronic communication channels.
11. Zero balance in the transactional bank accounts, closure of all related bank accounts.

LET'S FIRST CHECK OUT

THE GENERAL MODUS OPERANDI INVOLVED IN MOVING AND PARKING MONEY BY THE CYBERCRIMINALS.

The money that is extracted from the victims of online /cybercrimes is generally routed to the bank accounts as hereunder:

1. The accounts belonging to the suspected fraudsters or their associates.
2. Mule accounts used by the fraudsters.
3. Accounts created by criminals using stolen or synthetic identities.
4. Accounts belonging to legitimate customers who have allowed the criminals to use their accounts for fraudulent activities over some sort of consideration monetary or otherwise (account holder has knowledge of crime).

5. Accounts belonging to legitimate customers who have allowed their accounts to be used by the criminals out of ignorance. (account holder has no knowledge of crime).
6. Some ordinary citizens or business establishments whom the fraudsters may have transacted for utilizing or buying various services or property/products.

THE PROCESS OF IDENTIFYING MONEY TRAIL IN ANY STANDARD CYBERCRIME INVESTIGATIONS

The process of identifying the money trail in case of cyber-crimes/ financial frauds involves analysing and examining financial statements, documents, or any other evidence that may point to:

1. The bank accounts of the perpetrators.
2. Fixing up the genuine identity and whereabouts of the offenders from the information borne out from KYC documents (Issuing notice under section 91 CrPC/ 94 BNSS).
3. Fixing the tagged bank accounts in case of payments made through various financial wallet services.
4. For the UPI-based transactions fixing up the associated bank accounts.
5. The origins of the money involved/pressed in the process.
6. Track and analyse financial movements within the setup and across the setup of organizations and individuals associated with it.
7. Track to the destinations where the residual money is parked for the purpose of consumption of the offenders after all the associated processes and functions of the crimes come to a permanent halt.

Several tools and techniques such as forensic accounting and data analytics are used for the purpose.

THE ULTIMATE MOTTO OF THE INVESTIGATORS, IS TO PROVIDE RELIEF TO THE VICTIMS BY RECOVERY OF DEFALCATED MONEY FROM THE BANK ACCOUNTS OF THE ACCUSED/BENEFICIARIES.

Times of India Internet edition June 19, 2023 reports: "The Gujarat CID has found a way to cut the red tape. By invoking a special provision in Section 457 of the Criminal Procedure Code (CrPC), the sleuths have returned Rs 8. 29 crores to 3,904 cybercrime victims in two months through special Lok Adalat's held across Gujarat, said police sources".

The investigations of any crime by the police or investigating agency have the primordial aim to penalise the perpetrators of the crime, that being so however, in addition, there is also a need to provide relief by effectuating the recovery of monies lost, the processes that are generally involved are:

1. Issuing notices under the provisions of law (102Cr PC / 106 BNSS) to all the concerned banks or financial intermediaries to debit freeze the accounts through which the money flows related to the crime are observed or a substantial amount of money is found to be parked giving rise to the reasonable suspicion that the same is obtained by the process of criminal activities.
2. The investigator shall generally issue a notice to the concerned-suspect account holder through the concerned bank or financial intermediary for the appearance or production of necessary documents in support of the claim of the legality of the amount of money present in the account.
3. If the suspected account holder does not respond to the notice issued, the investigators shall file a petition to the jurisdictional court as per relevant provisions of law seeking an order to the bank or financial intermediary to deliver the suspect amount so frozen to the account of the victim preferably the account from which the money was remitted/invested/siphoned during the course of the cybercrime.
4. In all the processes the investigator has the bounden professional liability to clearly establish the entitlement of the victim with respect to the parked money as discovered during the process of investigation and the same should be based purely on evidence collected during the investigation process.

CASES WHERE A VICTIM IS ALSO THE BENEFICIARY. AN ILLUSTRATIVE CASE STUDY

Facts manifest: Mr. X is a cybercriminal he chances to meet Mr. Y who is a businessman by profession through social media interactions. Mr. X impresses Mr. Y by telling him rosy tales of astronomical returns from investments if monies are systematically invested in stock trading and trading in cryptocurrencies/blockchain systems.

The purported scheme and its settings: Mr. X reveals that he is a super trader in stocks and blockchain systems and he has a large group of followers who regularly invest through him. To instil confidence in Mr. Y he adds him to a closed WhatsApp group where MR. Y finds numerous prospective clients of Mr. X.

Interactions galore in the dedicated WhatsApp group The participants are very much optimistic about the schemes offered by Mr. X, there are certificates that all are

being paid handsomely, live interactive sessions in the group sing higher returns and fantabulous pace in which investing amounts by the participants gets multiplied.

The initial investment: Mr. Y invests a sum of 10 lakhs he is directed to transfer the amount through NEFT to a designated bank account which is registered under the name of XYZ company of Mr. X. MR. Y is provided with a money receipt from the company plus provided with a copy of an agreement wherein it manifest that Mr. Y is entering into an agreement with Mr. X and the later has taken a loan of 10 lakhs from him to invest in his company and agreeable interest rates will be provided to Mr. Y on monthly basis.

The honeymoon period: Mr. Y receives an interest of 10% per month of the invested sum, the same is wired directly to his bank account from the company account of Mr. X, he receives the interest for two months.

The saga of chain building: Mr. X further suggests to Mr. Y not to just remain as an investor but to turn into his partner in the novel business process, and buoyed by the initial returns he agrees.

The new leader establishes his new team: Mr. Y ropes in 10 like-minded individuals some of whom are personally known to him and some others through social media interactions, who agree to invest in the scheme a sum of 10 lakhs each all are promised the same quantum of return in the same processes as is made available to Mr. Y that apart Mr. X the mastermind, also promises Mr Y a handsome commission for his efforts of team build-up.

The Team under Mr. Y swells: More people join more commission is accrued in the bank account of Mr. Y everything goes smoothly.

The Bubble burst: After about a year of operation suddenly Mr. X vanished in thin air, the preceding months' payments stopped abruptly but Mr. X the mastermind kept assuring everybody that that was a mere passing phase and everything would be normal again, however, his sudden act of vanishing makes all bamboozled, all mobiles switched off the residence and offices closed, no clue, no trace, no lead/anticipation nothing but all void.

The Realisation: The WhatsApp group members including Mr. Y and his team of investors realise that the scam happened, like Mr. Y other 10 such leaders and members of the team decide to lodge an FIR with the Police against Mr. X for the purpose they shot multiple complaints, the police make a preliminary inquiry and summing up all the complaints and the number of monies defalcated records FIR.

The Charge in FIR: Mr X in collusion with unknown others had cheated/committed CBT in respect of invested money of numerous investors amounting to a sum of crores.

The Investigation and Money Trail: The investigation reveals money that was invested/transferred to the company bank account of Mr. X by the investors was rerouted mostly to the other investors as a return of investments. However, at regular intervals Mr. X withdrew some portions of the money in cash, the bubble burst when the flow of new investors trickled down considerably and there remained no excess money to reroute.

The Loop where all the Victims are beneficiaries: The money trail reveals that inflow of money on the accused accounts by one investor found concurrent outflow to the accounts of the other investors, thus one recipient is the beneficiary of another investor and the other investor is again the beneficiary from some other investor the cobweb so spun has the central character in Mr. X like the menacing money sucking spider.

End result: No recovery of money can be effectuated by the investigating agency from any of the beneficiary accounts though evidence galore provides ample scope for submitting the final report of investigation against Mr. X.

THE PRIMARY INSTITUTIONAL STAKEHOLDER IN THE PROCESS

BANK AND OTHER FINANCIAL INSTITUTIONS

- The bank and the financial institutions are the main stakeholders in the process as the process of transit of funds is effectuated through their channels.
- In these types of multiple voluminous transactions the entire gamut of operations, including the volume of transacted funds are automatically interpreted as general financial transactions of any company, without any physical scrutiny of the actual functioning of the same.
- No red flags are raised with any of the regulatory/law enforcement agencies in spite of the fact that remittances inwards/credits in the company accounts were made by numerous individual investors and not by institutional investors.
- Regular cash withdraws did not raise any institutional perception analysis and necessarily follow up or dissemination of information, with either the regulatory / law enforcement agencies.

THE NEED OF THE HOUR विज्ञानं जनसुरक्षा च - राष्ट्रसेवार्थम्

LEGISLATIVE PROCESS

Necessary fine-tuning/amendments in the statutes/regulations to plug the loopholes or to make a responsive system where any of the aforesaid patterns in the financial

transaction needs to be recognised/interpreted/analysed by the banks and the non-banking financial institutions as part of SOP and the information emanated out be mandatorily shared to the regulatory authorities or the law enforcement agencies on case to case basis or at regular intervals depending on the volume and nature of transactions and the veracity of the situation. Fixing accountability in case of lapses.

The Regulatory agencies: The financial regulatory agencies must evolve a system of periodical financial audit or if there exists any provision of periodical financial audit the same must be incorporated with procedures that may detect aforesaid financial activities and action-taking provisions.

The Law Enforcement agencies: In addition to prompt action and follow-up investigation and legal processes the law enforcement agencies must take up the issues in mass-scale public dissemination campaigns, the ode that prevention is better than cure is to be followed in true spirit and enthusiasm.

SOME POPULAR INITIATIVES OF KOLKATA POLICE FORCE

- 1) Dissemination of information through LED screens at major traffic intersections. One such reads as "Do not invest in online, App based investment schemes".
- 2) Dissemination through official social media handles.
- 3) A cyber awareness motorbus runs through the length and breadth of the metropolis stopping at educational institutions, and neighbourhoods to make students, senior citizens, and general citizenry aware of the travails of online /financial /cybercrimes.

CONCLUSION

The need of the hour is to remain updated; the need of the hour is to act in unison, multiple government agencies including the police should work together to stop the drainage of hard-earned public money in the hands of the crooks. It needs to be noted that criminals are super innovative and diligent in devising new ideas the prescriptions of law are readily available to the public over the Internet accessible by Smartphone and legal interpretations of the courts of law are not the exclusive property of the learned few, so we collectively need to outsmart them to save the society, to enforce law and order.

About the Author

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THEME 6:

POLICING IN SMART CITIES-PROGRESS AND CHALLENGES



SMART CITIES, SMARTER POLICING: LAW ENFORCEMENT STRATEGIES IN INDIA'S URBAN FUTURE

Shreyasi Vats

ABSTRACT

The incorporation of advanced technologies into urban governance has given rise to the idea of "smart cities," where big data analytics, machine learning, artificial intelligence, blockchain technology, and the Internet of Things are being harnessed to ensure a sustainable efficient, seamless and effective urban landscapes. In India, the Smart Cities Mission, launched in 2015, aims to modernise urban infrastructure, enhance service delivery, and promote citizen-centric governance. Central to this transformation is the progressive concept of "smart policing," which leverages these technologies to improve law enforcement and public safety. This paper explores the intersection of smart cities and smart policing in India, highlighting key components such as surveillance systems, integrated command centers, smart traffic management, and digital policing platforms. It also examines the challenges posed by privacy concerns, data security, and infrastructure limitations, while showcasing successful implementations in various Indian cities. The paper concludes by discussing the future potential of smart policing in India's urban landscape and the need to address emerging challenges to ensure its effective and sustainable implementation.

As urban landscapes evolve at an unprecedented pace in the 21st century, cities are grappling with complex challenges in ensuring safety, efficient resource allocation, sustainability, and quality of life. As a result of this, the idea of "smart cities" emerged, which is an intertwined relationship between the urban landscapes and the emerging disruptive technologies. The essence behind this concept is to strengthen the current position and to create a more sustainable and responsive urban environment. Parallel to this evolution is the advent of the "smart policing" concept which leverages these same technological advancements to revolutionize law enforcement and public safety.

The confluence of smart cities and smart policing showcases a progressive approach to urban governance. In the 21st century, the adoption of emerging disruptive technology has not remained optional; rather it has become an imperative component of our lives. As a result of this, the Government of India introduced the Smart City Mission in 2015, to modernize and transform cities across the country. The mission aimed to create an urban ecosystem effectively managed by advanced technologies along with integrating the ideas of sustainability, citizen-centric governance, inclusive society, digital transformation, and resilient infrastructure.

There are several components of the Smart City Mission; it focuses on enhancing urban infrastructure by modernizing roads, water supply, solid waste management and electricity networks to ensure better service delivery. The most important component of the mission is to leverage technology to improve governance, management, and public service, ensuring a more responsive and effective structure of the city.

As the policing system ensures the safety, security, and smooth functioning of urban areas, it becomes a prerequisite to focus on the amalgamation of policing systems with the Smart City Mission. The role of the police is crucial to ensure the smooth functioning of the urban networks. The police are majorly responsible for enforcing laws, preventing crimes, protecting life and property, maintaining law and order, and controlling traffic. The responsibilities further include investigating crimes, making arrests, patrolling, community policing, responding to emergencies, managing crowds, de-escalating conflicts, and so on.

Prime Minister Shri Narendra Modi ji in the address at the DGP's Conference held in Guwahati in the year 2014 called for making the police force SMART which stands for (1)

- S-Strict and sensitive
- M- Modern and mobile
- Alert and Accountable
- R- Reliable and Responsive
- T- Techno- savvy and Trained

Thus, the goal is to establish seamless integration of the concept of smart policing in Smart City Mission.

KEY COMPONENTS OF SMART POLICING IN INDIAN SMART CITIES

1. SURVEILLANCE AND MONITORING SYSTEMS

For the prevention of crime, surveillance and monitoring systems become pivotal in an urban setup. In order to develop a substantial system, there has been extensive deployment of CCTV cameras across cities for real-time monitoring of public spaces, important traffic routes, and critical public-centric infrastructure. This network of CCTV surveillance and monitoring helps in deterring criminal activities and provides evidence for investigations.

Additionally, the application of drones and aerial surveillance for search and rescue operations, accident reconstruction, and crowd monitoring during large public gatherings, festivals, and emergencies, providing real-time aerial footage to law

enforcement agencies ensures effective crowd management. Furthermore, drones can be deployed for thermal imaging, location mapping, gathering evidence, and ensuring compliance during demonstrations and curfews.

2. INTEGRATED COMMAND AND SMART CONTROL CENTERS (ICCCS)

Centralized monitoring is important to initiate a coordinated response to an incident, quick decision-making, and efficient resource allocation.

These centers act as the nerve centers for smart policing as they help consolidate data from various sources like CCTV feeds, emergency services, and IoT sensors.

The command centers use artificial intelligence and big data analytical tools to predict, prevent, and respond to crime patterns. They act as predictive policing tools by analysing criminal databases under CCTNS (Crime and Criminal Tracking Networks and System) which in turn help in crime hotspots zoning and deployment of necessary preventive force. The integration of smart control centers with CCTNS boosts the ability of the system for effective policing by ensuring the development and integration of data and crime records across police stations and providing centralized citizen portals for a number of citizen-friendly services.

ICCC focuses on real-time analysis of data that helps in effective management of traffic by tracking the chokepoints and ensuring smooth functioning of traffic lights in times of peak traffic hours. They foster inter-departmental coordination.

3. SMART TRAFFIC MANAGEMENT

As of 2024, in the first half of the year, over 2.37 lakh challans were issued for stop-line violations, which represents a 32% increase from the year 2023.

This data point highlights the need for effective and functional traffic management systems in order to curtail the mismanagement and chaos on the roads.

The implementation of an automated traffic violation system by incorporating automated license plate readers (ALPRs), smart cameras, and AI sensors in order to detect and record traffic violations like speeding, red-light jumping, and unauthorized parking followed by automatic issuance of e-challans (electronic fines), has become a pressing priority.

Recently, a tender by the Delhi Transport Infrastructure Development Corporation for the installation and operation of an automatic number plate recognition (ANPR)(4) detection system was floated which involves the incorporation of AI cameras to detect violations related to pollution, theft by cross-checking the data of Vahan or other

agencies with the respective number plates.

These ANPR cameras would enable the accessibility of speed-based violation notices to car owners. The challan is intended to be issued by an intelligent e-challan system that can generate e-notices for law-violating vehicles detected through video analytics. Another important element for better management of traffic would be the adoption of adaptive traffic signals AI-driven system inspired by the TOPIS 3.0 traffic management system of Seoul, which should be synchronized with real-time traffic data for managing congestion and ensuring smooth traffic movement, reducing the probability of accidents and enabling quicker emergency response times.

4. DIGITAL POLICING PLATFORMS

Community policing is the essence of the policing system. The need to have an accessible, easily available, inclusive, and citizen-centric digital network is pivotal for effective service delivery. Governance & policing platforms along with mobile applications are being introduced to ensure services are instantly delivered. Platforms and mobile applications are being used to report incidents, and crimes, file complaints, receive alerts, and boost collaborations with respective authorities to address safety and security concerns. request police assistance online improve accessibility, and reduce response times. Examples of these are Jeevan Portal- Delhi Police, websites of Uttar Pradesh Police, Mumbai Police being some of them.

Digital policing platforms can help in crime mapping, identification of trends, and strengthening reporting tools using Geographic information systems and remote sensing tools.

5. CYBERSECURITY AND CYBERCRIME UNITS

The Indian Cyber Crime Coordination Centre (I4C) in 2024 reported an average of 7,000 cybercrime complaints daily, which resulted in a surge of 113.7 %, compared to the period between 2021 and 2023.

There are specialized cybercrime units within smart cities to tackle increasing incidents of Distributed Denial-of-Service (DDoS) Attacks, phishing, botnets, cyberstalking, cyberbullying, identity theft, and online fraud. The central government's National Cyber Crime Reporting Portal is a platform for the registration of cyber complaints. In order to prevent cyber crimes, there emerges a need to strengthen the cyber threat intelligence units along with capacity-building measures to ensure that the existing police personnel are well versed with the new emerging threat. For instance, widening the scope of initiatives like Cyber Dome of Kerala to bridge the technical gap by seeking

assistance from private experts.

6. COMMUNITY POLICING AND PUBLIC ENGAGEMENT:

Leveraging social media platforms like Facebook, Instagram, and YouTube for community outreach, disseminating information, and engaging with citizens in real time will help foster trust and cooperation between the community and the police. The introduction of mobile applications that will empower citizens to alert in case of emergencies, share vital information, and receive safety alerts will help boost public engagement.

7. DATA-DRIVEN POLICING

Data analytics play a vital role in smart policing. Big data analysis ensures more efficient resource allocation by ensuring better identification of crime hotspots and predicting potential criminal activities. Platforms like CCTNS and NAFIS ensure access to integrated databases from various sources for a more enabling, comprehensive, and strategic investigation.

The mechanism of data-driven policing will strengthen the concept of predictive policing i.e. anticipation of crimes, offenders, victims, and identification of perpetrators.

Certain successful predictive policing tools adopted are as follows-

- Delhi's CMAPS (Crime Mapping Analytics and Predictive System) is being used for zoning crime hotspots by processing and evaluating information from historical crime data, helpline numbers, and ISRO satellites.
- Hyderabad Police is utilizing the data from the "Integrated People Information Hub" which comprises information on the family, profession, and banking activities of an individual, to identify persons inclined and more susceptible to commit crimes.
- PredPol of the U.S. makes forecasts using a big data analysis and machine-learning system. The core components of the prediction of the crime include the type, location, date, and time of the crime. It organises patrol operations using a data-driven strategy, which reduces crime rates.

8. EMERGENCY RESPONSE SYSTEMS

In smart cities, emergency response is enhanced through integrated communication systems that connect various agencies like the police, fire department, and medical services. This ensures a coordinated response during emergencies, improving response times and effectiveness. For example, Pune has implemented a smart traffic

management system that prioritizes emergency vehicles like ambulances. The system uses GPS data to monitor the location of ambulances. The DIAL 100 initiative of Uttar Pradesh Police ensures quick response to emergencies.

CHALLENGES

1. **Privacy Concerns:** The extensive use of surveillance and monitoring technologies, such as CCTV cameras and drones, raises concerns about the potential for invasion of privacy. Balancing the need for security with citizens' right to privacy is a significant challenge.
2. **Data Security:** The reliance on digital platforms and data collection makes smart cities vulnerable to cyberattacks. Ensuring the security of sensitive data and maintaining the integrity of law enforcement systems are critical issues.
3. **Technical and Infrastructure Limitations:** Many cities face challenges related to the existing infrastructure, such as poor connectivity, outdated systems, and inadequate power supply, which can hinder the effective implementation of smart policing technologies.
4. **Funding and Resource Allocation:** As per the funds for NGO report only 0.76% of the GDP of India is allocated to law enforcement agencies which is less than the recommended 2%. The deployment of advanced technology requires substantial financial investment, which can be a constraint for many cities. Ensuring consistent funding and efficient use of resources is crucial for the sustainability of smart policing initiatives.
5. **Training and Capacity Building:** The successful implementation of smart policing requires law enforcement personnel to be trained in using new technologies and data-driven approaches. There is often a gap in technical skills and understanding among police forces, which needs to be addressed through continuous training and capacity-building programs.
6. **Legal and Regulatory Framework:** The legal and regulatory framework governing the use of surveillance, data collection, and digital policing is still evolving in India. There is a need for clear policies and guidelines to ensure that smart policing initiatives are implemented in a manner that respects citizens' rights and is in line with the law.
7. **Integration and Interoperability:** Integrating various technologies and ensuring they work seamlessly together is a complex task. Interoperability between different systems and agencies is crucial for the success of smart policing.

8. **Resource and Skill Gaps:** Implementing smart policing requires significant investment in technology and training. Many cities may face challenges in upgrading their existing infrastructure and equipping their police forces with the necessary skills.
9. **Cybersecurity Threats:** The reliance on digital systems makes smart cities vulnerable to cyberattacks. Ensuring robust cybersecurity measures and response strategies is essential to protect against potential threats.

PROGRESS AND SUCCESS STORIES (10)

NORTH INDIA

Varanasi (Uttar Pradesh)

- **Surveillance Network:** Installation of more than 3,000 CCTV cameras covering key areas, resulting in a 15% decrease in thefts and assaults.
- **Trinetra app 2.0** metamorphized the policing system in Uttar Pradesh by offering advanced technological upgrades such as quick suspect identification, QR code generation for seized goods, and voice sample analysis in cases related to cybercrime. The application of the Trinetra app 2.0 has enhanced operational efficiency by providing frontline officers with access to digitized criminal records, facilitating quick suspect identification during security checks.

WEST INDIA

Pune (Maharashtra)

- **Traffic Accidents:** 12% reduction in road accidents due to the implementation of intelligent traffic management systems.
- **Response Time:** 10% decrease in response times for non-emergency incidents.
- Pune has launched the "Pune Smart Police" initiative, which includes the deployment of mobile apps and online portals for citizen reporting. Through the "Police Mitra" app, residents can report non-emergency incidents, traffic violations, and safety concerns directly to the police. Since its launch, there has been a 15% increase in crime reporting and a 10% decrease in response times.

EAST INDIA

Bhubaneswar (Odisha)

- **Crime Reduction:** 20% reduction in crime rates in CCTV-monitored areas.

- **Emergency Response:** 30% improvement in emergency response times due to the ICC.
- **Traffic Safety:** Enhanced traffic management systems have resulted in a 15% reduction in traffic accidents.

CENTRAL INDIA

Indore (Madhya Pradesh)

- **Street Safety:** 18% reduction in street crimes like theft and assault due to extensive CCTV surveillance.
- **Traffic Violation Monitoring:** Automated systems have led to a 22% increase in traffic fines issued.
- **Emergency Response:** 25% faster response times to emergencies due to the integration of surveillance and communication systems.

NORTH-EAST INDIA

Guwahati (Assam)

- **Surveillance Network:** Over 1,500 CCTV cameras were installed, resulting in a 10% reduction in urban crime.
- **Traffic Management:** 15% improvement in traffic flow and a 12% decrease in road accidents with smart traffic signals.

WAY AHEAD

1. Machine Learning (ML) & Artificial Intelligence (AI)

Exhaustive incorporation of AI-driven predictive analytics tools to map potential crime hotspots bolstering predictive policing. The implementation of facial recognition systems to identify suspects by analysing video footage, gait analysis, and voice analysis will ensure speedy investigations and enhance security. The adoption of Natural Language Processing (NLP) tools can assist in analysing large amounts of distributed and unsorted data, from social media platforms or online websites for the detection of potential threats and activities that could disrupt the law and order.

2. Internet of Things (IoT)

IoT-enabled sensors and cameras can be deployed across cities for monitoring and surveillance purposes. IoT enabled firearms can be incorporated to keep the unauthorised use to weapons in check. IoT technology in police vehicles can ensure real-

time communication with command centres by integration of CCTNS database with smart patrol vehicles along with access to databases, and the ability to control traffic lights or monitor other connected vehicles during pursuits.

3. Drones

Drones fitted with thermal imaging high-resolution cameras and night vision capabilities can be used for monitoring and surveillance as well as for crowd control, and search and rescue operations. They can be used in prisoner transportation tracking and even for 3D reconstruction of crime scenes using FARO zone software.

In high-risk situations, such as hostage scenarios or natural disasters, drones provide crucial real-time intelligence, reducing the risk to officers and improving situational awareness, as is done in Australia.

4. Blockchain Technology

Blockchain's immutable ledger system can ensure that evidence is securely recorded, tracked, and verified, preventing tampering or loss. This is particularly useful in maintaining the integrity of digital evidence. Blockchain can be used to manage and verify identities in a secure, decentralized manner, reducing the risks associated with identity theft and ensuring the accuracy of identity records in policing.

In order to prevent the procedure of investigation from subjectivity, personal bias, and malpractices, the incorporation of blockchain technology for lodging in details of every stage of investigation would ensure integrity and honesty.

5. Virtual Reality (VR) & Augmented Reality (AR)

VR & AR can provide an immersive training environment for police personnel. These tools can allow them to practice responses to various scenarios, such as active shooter situations, and bomb threats, without real-world risks.

AR can overlay critical information onto an officer's field of vision during operations, such as maps, suspect information, or real-time incident updates, enhancing decision-making in the field.

6. Robotics

Autonomous robots are increasingly used for tasks such as bomb disposal, hazardous material handling, dealing with hostage situations, and reconnaissance in dangerous environments, keeping officers out of harm's way. In some areas, autonomous patrol robots are deployed to monitor public spaces, detect suspicious activities, and interact

with the public, providing an additional layer of security.

7. Big Data and Advanced Analytics

Big data analytics allow the police system to process large amounts of data derived from multiple sources, for instance from crime reports, surveillance and monitoring setups, social media platforms, and public records, to identify patterns, trends, and certain other connecting information that can help plan police strategies and predict the criminal activities. Analysing social media and other communication channels to gauge public sentiment can help police anticipate unrest, monitor community relations, and adjust strategies to address emerging concerns, especially during elections or other polarising events.

8. Body-worn cameras (BWC)

BWCs provide a first-person view of police interactions with the public, promoting transparency and accountability. Advances in this technology include automatic activation in specific situations and integration with other systems for real-time data transmission.

9. Cybersecurity and Digital Forensics

To secure communications and sensitive data, law enforcement agencies are adopting advanced encryption methods, ensuring that critical information is protected from unauthorized access. As cybercrime becomes more prevalent, digital forensic tools and experts are essential for extracting, analysing, and preserving evidence from digital devices.

10. Biometrics

Beyond facial recognition, law enforcement agencies are using multimodal biometrics, including fingerprints, iris scans, and voice recognition, gait verification to enhance identity verification and criminal identification processes.

At airports, border crossings, and other security checkpoints, real-time biometric screening systems can help identify persons of interest or individuals on watchlists quickly and accurately.

11. Increasing Public Awareness & Police Accountability

CONCLUSION

Smart policing is an integral part of India's Smart Cities Mission, with the potential to transform urban safety and law enforcement. By integrating advanced technologies like

surveillance systems, real-time data analytics, and digital platforms, smart cities can enhance the efficiency, transparency, and responsiveness of policing. However, the successful implementation of smart policing requires addressing challenges related to privacy, data security, infrastructure, funding, and legal frameworks. As more cities progress in their smart city journeys, the lessons learned and best practices developed will be crucial in shaping the future of policing in India's urban areas. In the DGPs conference of the year 2014, Honourable Prime Minister Shri Narendra Modi ji called for transforming the police force into a SMART entity. Now, as we look to the future, it is crucial that we aim to make our police forces SMARTER, where the E represents Emerging Technology and R represents a Reformative outlook.

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GANDHINAGAR

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CHALLENGES AND PRIORITIES TO POLICING A SMART CITY: A EXPLORATORY CASE STUDY ON THE CITIES OF KOLKATA AND BHUBANESWAR

Dr Arpita Mitra & Prof. N.K. Chakrabarti

ABSTRACT

The annunciation of Bhubaneswar and Kolkata among the first 20 smart cities in India aroused a lot of expectations from the police and the governance of the city. Policing is a very ardent part of administration involving the maintenance of peace, security, and well-being of the populace. In this regard, it is quite a call of the day to explore what are the challenges that the police and people have to meet to prove worthy of the accolades. Further, it is also needed to set the priorities that have to be catered to by the police and the people in making Bhubaneswar and Kolkata, smart 21st-century cities in India. Policing is one such activity and therefore the sense of belonging to one's own city can be fostered if its day-to-day safety, protection, and development involve its residents. If responsibilities are shared then challenges, priorities, and a glowing future can also be fulfilled together. The present research seeks to explore and compare what the people and the police in Bhubaneswar and Kolkata opine about the challenges and the priorities that are to met to be continue fulfilling the expectations of being smart cities in India.

INTRODUCTION

In recent years the Government of India has focused substantially on the issue of crime and urban lawenforcement. From the crime statistics , it is revealed that crime is unevenly occurring in various smart cities in India. Therefore, the question of the perception of people regarding policing in smart cities requires testing or thorough study. Owing to the unique characteristics of cities in India urban policing is a central governance challenge. That is why we have seen a variance in crime rate in smart cities and it's the pattern of law enforcement. This is also discernible among various low and middle-income countries including India.⁶³ The reason for this variance may be due to a series of factors, like urban density, inequality, poverty among the citizens,

⁶³ UNO HABITAT, For a Better Urban Future, Introductory Handbook on Policing Urban Space, Criminal Justice Handbook Series, 2011, New York, p.5.

urban design, planning, and management.⁶⁴ The present study is an attempt to unravel the contentions and precedence of policing a smart city in the opinion of the people and the police in the cities of Bhubaneswar and Kolkata. The success of today's policing depends on mass involvement. Policing is no longer the responsibility of the police organization as such. New policing or 21st-century policing aims at bringing the people to the fore and ensuring their active participation to meet the challenges of a growing population and added responsibilities. Therefore, a smart city will ensure that its citizens are active, involved, and empathetic towards any cause of the city.

The "Smart Cities Mission" was initiated on 25 June 2015. The primary objective of the Mission is to highlight cities that provide fundamental infrastructure, spotless and sustainable geographical areas, and give a presentable quality of life to the citizens by providing 'smart solutions'. It intends to foster economic growth and ameliorate quality of life through all-encompassing efforts on social, economic, physical and organizational principles of the city. The six central principles that hold the foundation of "Smart Cities" are (1) Community (2) Sustainable use of Resources, (3) Innovation, Integration and Sustainability, (4) Convergence, (5) Technology and (6) Cooperative and Competitive Federalism ⁶⁵ (Kumar, 2017, pp.183-196).

POLICING A SMART CITY

Policing is a characteristic of social control processes that involves vigilance and sanctions to guarantee the safety of the social milieu (Morin 2013 , pp.288-93). The 'police' is a specialized, state-organized body with the primary responsibility for deploying legitimate force to safeguard security existing only in relatively complex societies (Storch, 1976, pp.76-78; Cooper, 2011). A "smart city " attempts to provide basic infrastructural support and a decent standard of living to the people maintaining

⁶⁴ Global Report on Human Settlement 2007, Enhancing Urban Safety and Security, U N Publications Sale No.E07,III q 1, pp.67-72.

⁶⁵ <https://smartcities.gov.in/about-the-mission> visited on 12th December, 2023.

and preserving a safe and sustainable environment. The “smart city” vision aims to enhance the entire urban landscape and culture through institutional, physical, social, and economic systems namely (i) decent supply of water, (ii) uninterrupted supply of electricity, (iii) hygienic living conditions and solid waste management, (iv) smooth urban mobility and public transport, (v) shelter for everyone, especially the poor, (vi) advanced internet network and digitalization, (vii) effective governance - e-governance and citizen involvement, (viii) sustainable environment, (ix) safe and secure surroundings (x) healthcare and educational opportunities.

“Smart Policing” utilizes technologies like (a) electronic surveillance through CCTV cameras placed at hotspots (b) virtual observation of incidents, riots, and decision making without much patrolling in the streets; (c) supervision of law and order by superior officials; (d) management of events like fair, festivals and religious processions; (e) security alarm system in public places and vehicles; (f) E-FIR provisions of theft of vehicle and mobile phone; (g) real time monitoring of patrolling, (h) Smart Traffic System includes Automatic Traffic Lights, Online Traffic Monitoring, Emergency kiosks/counters, Advanced Information System.⁶⁶

THEORETICAL FOUNDATION OF THE STUDY

The idea of explaining urban transformation from the perspective of policing urban areas in general and smart cities, in particular, can be explained from the philosophy of community policing.

(a) Community Policing as Operational Initiatives: Community policing is a process rather than a product. These principles underlie a host of specific programs and policing tactics as organizing meetings and crime-prevention seminars, publishing newsletters, forming neighbourhood watch groups, organizing youth activities, conducting surveys to measure community satisfaction or surveys of citizens to find

⁶⁶<http://smartcities.gov.in/content/http://smartcities.gov.in/content/innerpage/cities-profile-of-20-smart-cities.php>; <http://www.bprd.nic.in/SmartPolice1.aspx> and <https://www.thehindu.com/news/national/prime-minister-narendra-modi-bats-for-smart-policing/article6648405.ece> visited on 12.6.2023.

out what problems concerned them, establishing adversary panels, conducting drug-education projects, media campaigns, working with municipal agencies to enforce health and safety regulations, increased use of foot patrols, increased attention to victims of crime, etc. (Skogan and Hartnett 1997,p.5; Germann, 1969).

(b) Organizational Transmutation and Decentralization: Community policing depends upon organizational decentralization and reorientation of police personnel in order to facilitate two way communication between police and the public. Field officers are expected to work more unconventionally at investigating situations, resolving problems, and educating public.(Myers 2013, pp.115-119; Ferrandino, 2013).

(c) The philosophy or strategy or style of policing The fundamental philosophy underlying these new 'community policing' programmes is that the police not only need public support in order to accomplish their goal, but that they have an obligation to involve the community in the process of deciding what they do and how they do it. The new professionalism implies that police serve, learn from and are accountable to the community (Skolnick and Bayley, 1985,pp.212-13).

METHODOLOGY ADOPTED

The present endeavour is an exploratory case study where primary data was collected through direct face to face interview of residents and police personnel of the city of Bhubaneswar. Non- Probability sampling techniques is used to collect the sample. More specifically, convenience, purposive (age group of residents, designation of police personnel) and snow balling (contacts/acquaintances of the residents) have been employed to collect primary data. 200 residents each from the city of Bhubaneswar and Kolkata and 50 police personnel each of the rank of Inspectors posted in the police commissionerates of Kolkata and Bhubaneswar comprise the sampling units of the study. A total of 400 residents (200 male and 200 female) and 100 police personnel is the sample of the study.

EXPLORING THE CHALLENGES AND PRIORITIES TO POLICING A SMART CITY

A. Opinion of the people about the Smart City Police

- 54 percent males and 56 percent females in Bhubaneswar feel that the police is good. However the Kolkata residents have a mixed response towards their opinion about the police.
- 41 percent of the residents of the city of Bhubaneswar are happy about sharing a cordial relationship with the police. However the Kolkata residents mostly prefer not to comment about the relationship between the people and the police.
- More than 80 percent of the male residents of both the cities males have visited the site of the commissionerate of the city police. A good number of the residents are aware of online FIR and Traffic Information like missing vehicles from the website.
- More than 85 percent of the male residents of both cities are satisfied with the interaction with the city police. The satisfaction level among women residents is less than 80 percent.

B. Opinion of the people about challenges to Smart Policing

- The issues that most of the residents have stressed in respect to smart policing are online services, upgradation, physical agility and better organization. 34 percent of the male residents of Bhubaneswar and 56 percent of the female residents of Bhubaneswar believed that steps are being taken by the commissionerate to initiate smart policing. In Kolkata 38 percent of the residents have confirmed that smart policing initiatives have been undertaken but a significant 40 percent of the respondents are oblivious of the fact. The measures undertaken by the city police includes patrolling, 24x7 helplines providing several community and security services, well equipped police force.
- 64 percent of the residents of Bhubaneswar and 72 percent of Kolkata claimed that crime rate is showing an increasing trend in the city. Most were of the opinion that there is an increasing trend in newer dimensions of crime and

cybercrime. The residents of both the cities have pointed out that there is an increasing trend in cyber crime and property crime. However crime against women is considered as a rising problem by the Kolkata residents in greater percentage as compared to Bhubaneswar.

- In Bhubaneswar both men and women (70%) have claimed that property crime is most rampant followed by cyber crime. However crime against women is not a common crime. In Kolkata, however we find that 25 percent of the residents have claimed violence against women as quite frequent. However, property crime is the most common and third is cyber crime.
- 60 percent of the residents of Bhubaneswar are not satisfied with the measures undertaken to combat increasing crime trends. In Kolkata, 40 percent of the respondents are unhappy with the progress made.
- The residents of Bhubaneswar especially women (65%) were of the opinion that traffic management is good. Most males (48%) were of the opposite opinion. In Kolkata 49 percent of the women complimented the police to be efficient traffic managers. However nearly 65 percent of the residents of both the cities were aware that the police is using sophisticated technologies to control the traffic situation.
- More than 60 percent of the residents of Bhubaneswar and about 50 percent of the residents of Kolkata are not aware whether the city police offers to register online FIR. More than 75 percent of the residents of Bhubaneswar and 60 percent of the residents of Kolkata are unaware whether the city police offers to register online General Diary.
- The residents of Kolkata about 70 percent are happy the collaborative efforts are successful. In Bhubaneswar, about 40 percent of the residents are not aware whether these events are successful or not and about 34 percent have replied in the affirmative. The people of Kolkata (about 36%) feel that political interference is a serious challenge faced by the Kolkata Police. However, the residents of Bhubaneswar feel that lack of updated technology is a serious impediment to smart policing.

C. People's Priorities for urban transformation through smart policing

- The respondents were asked to mark on a scale of 10 (10 being of utmost important) about twenty issues as per the priorities that they wish to set for the city police. Most of the residents have marked out issues on a scale to 5 to 10. The priorities set forth by the residents of Kolkata Police tell us a lot about the trends in policing that the people are aware about. The rising cases of crime against women, children and elderly is a cause of concern for both the cities. Further up gradation of traffic to more tech-based system is also taken an issue to be addressed. Traffic congestion, road accidents and casualties thereof is a serious issue. Further, empowerment of the people in policing the neighbourhood can prevent crime and check anomalies. The people of both the cities are rocked by natural calamities and have witnessed quite a few super cyclones in the recent years. More proactive involvement of the police in disaster management is thus the call of the day.

D. Opinion of the Police Personnel of Kolkata and Bhubaneswar

(i) Opinion about City Police

- 92 percent of the Bhubaneswar police force and 78 percent of the Kolkata police force have a positive encouraging opinion about today's police. 86 percent of police personnel from Bhubaneswar and 78 percent of those from Kolkata believe that the relationship between the police and people is good.
- More than 90 percent of the police personnel have attended in service training programmes. They have received training on Cyber Crimes, Information Technology, Protection of Children from Sexual Offences Act, 2012, traffic management. All the officers were satisfied with the training and believed that more such training was required. Most of them felt the need to have further training to handle cyber crime. They also felt the need for sensitization on recent legislations like POCSO, 2012 and Prevention of Sexual Harassment, 2013. More than 90 percent of the respondent officers have not undertaken any personal courses. This may be because of their stringent work hours and stress.

(ii) Opinion about Smart City and Smart Policing

- The police personnel have identified several characteristics of smart cities. The most common ones are better infrastructure and technology, better communication and transportation, clean sustainable environment and hygienic conditions. All the police personnel have agreed that their city has all the qualities of being called a smart city. The police personnel have raised diverse issues which they feel are the characteristics of smart policing. The most relevant ones are people friendly easily approachable police and online services.
- The officers were of the opinion that there has been no change in the crime scenario. More than 60 percent were however of the opinion that there has been an increase in cybercrime. More than 90 percent of the officers were also of the opinion that there have thus been a change in crime trends. As pointed by the residents too property crime is the most common crime. However Kolkata also has a rising trend in crime against women.
- Patrolling and CCTV vigilance have been pointed out to be the measures undertaken for combating increasing crime trends.
- The police personnel have suggested that patrolling, CCTV, increase in number of police personnel and more specialized investigation can help combat crime.
- 80 percent of Kolkata Police and 60 percent of Bhubaneswar police were of the opinion that the traffic situation is good and under control. This has been possible because of CCTV at important junctions, strict implementation of law and high tech automated traffic signaling. However they have also pointed out that Drones, CCTV and strict law enforcement can help in managing the traffic congestion and unlawful activities.
- The police personnel of both the cities were of the opinion that the commissionerate offers online FIR, Online general diary and collaborative community service initiatives with NGOs.
- In response to detecting the challenges in the path towards smart policing a reality the police personnel have mentioned lack of adequate number of police

personnel, technological upgradation, lack of adequate infrastructure and training. Political interference has been observed as a obstacle to about 18 percent of officers of Kolkata Police force.

- A significant percentage of police personnel considered these priorities as of utmost importance for ensuring smart policing in these two smart cities: high tech patrolling, CCTV prevention of crime, identifying Crime Hotspots knowing your neighbourhood, empowering the people, community service programmes, awareness about traffic rules, awareness about recent legislation, combating environmental crimes, crime against animals, protection of monuments and artifacts, elder abuse, child abuse, violence against women, violence against marginals and disaster management.

RECOMMENDATIONS AND POLICY IMPLICATIONS

1. In the background of socioeconomic development in the smart cities, policing should give special attention to the local communities, families, children, and youth at risk, unemployed, migration, and social marginalization by adopting a humane crime prevention policy.
2. Every police station in the smart city should keep computer-based data on crime as well as criminals and be connected with all the police stations nationally.
3. It is observed that there is a lack of coordination among various departments of the Government working in these smart cities. Therefore a partnership should be developed across the Ministries, state authorities, NGOs, community organizations, business houses, and private citizens.
4. Policing in smart cities requires a fusion of local knowledge with adopted traditional policies. Effective policing in smart cities demands resource mobilization, a good relation between police and the public, and skills to maintain peace and security. Therefore, policing in smart cities should develop a system of coordination at the operational level among the various government departments, state officials, NGOs, and the neighbourhood.

5. In each city, there is domination of some areas by criminal gangs. In these areas, there is a need to develop proper vigilantism through ICTs. The police in smart cities should connect various communities including private protection services.
6. With the rapid growth of smart cities there is a need for adequate resources in order to sustain a minimum growth among the poor and vulnerable.
7. In our study it is also revealed that there exists a lack of trust between police and community. To improve the condition there is a need for cultural and managerial changes as well as to remove information or knowledge gaps. Hence there is a need to reform the way information is given to the public and at the same easy way of accessibility of people to police.
8. In India, due to economic conditions and poverty a large section of the population is socially excluded even in smart cities. Therefore, police should be connected to different government departments and work effectively to minimize differences of the availability of civic facilities in the cities, minimise the cultural conflict, firearms, because in these respects police has no control over the issues.
9. A good information system using Information and Communication Technologies (ICTs) needs to be developed to make the community aware of crime problems, accessibility, multiple causes behind crime and the prevalent practices.
10. India is following the 'due process model' of policing. Therefore, the constitution guarantees personal freedom and protection to be followed by the police. Hence the culture of observing human rights principles are to be inculcated among the police personnel.
11. Similarly, our constitutional principles of equality and the rule of law to be upheld in policing system in the smart cities so that police would realize the different need of men and women, rich and poor, and the vulnerable.
12. There should be frequent in-service orientation programmes for the police personnel at all levels to make them understand the changing objectives of

policing and police goals thereby updating strategies in response to the crime trends.

CONCLUDING REMARKS

The concept of smart policing and smart city is in its formative stage in both cities. There is awareness among the people and the police about recent developments and they have a strong opinion in setting the goals to smart policing. The challenges that have been put forward by the residents of the two cities of Kolkata and Bhubaneswar and have been supported by the police personnel explore the issues that are creating obstacles to police administration. These set forth the goals that are to be considered as countermeasures to overcome the challenges to policing a smart city. Further, the future of policing involves the inclusion of sophisticated Information and Communication Technologies (ICTs) and new models of urban policing like intelligence-led policing and predictive policing. The philosophy of restorative policing also adds hope as a new approach to policing a city. More so, police accountability, inclusive policies, and expertise in social skills can help us bring forth a police organization that is truly smart and a city that offers safety and sustainable living to its residents.

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IMPLEMENTATION, PROGRESS, AND CHALLENGES IN SMART CITIES

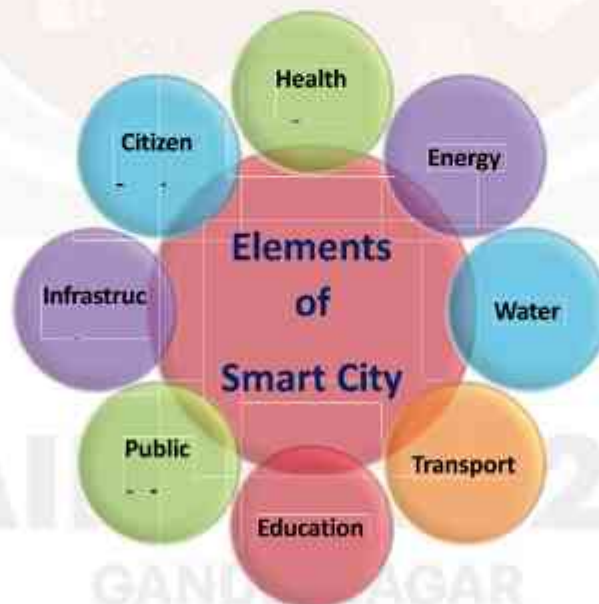
Chirag H Patel

INTRODUCTION

A Smart City should respond more quickly to City and international challenges than one with a simple 'global' relationship with its citizens. The term Smart City encompasses the idea of an environmentally friendly urban environment, technically integrated and carefully planned, relying on the use of information technology to improve efficiency.

"We shape cities, and they shape us." – Jan Gehl

Migration from rural to urban regions has seen a phenomenal rise due to various push factors in rural areas and pulls factors in urban areas, such as quality of life, and better economic and social factors. This migration has become a concern for sustainable planning as it affects land use planning and disrupts land cover to provide necessities like shelter, food, water, etc. therefore, it raises the need to prevent land use land cover (LULC) degradation. Urban planning has become a necessary profession for urban planners to model cities architecturally, socially, and economically as the population grows.



By the end of 2030, it is predicted that over 600 million Indians would reside in urban areas due to the country's startlingly rapid urban population growth. This uncontrolled rapid population growth, and increased demand for resources, make cities the primary sources of traffic congestion, pollution, and waste various socio economic problems, such as rising poverty, corruption, unemployment, and crime in

cities. To overcome these challenges and issues of urbanization, the Government of India has announced that it will build 100 Smart Cities in a country considered a vital step towards supporting economic growth and extraordinary urban growth.

The idea of a "smart city" has been developed to solve urban issues by utilizing information and communication technologies (ICT) to improve communication between the government, citizens, and businesses, lower costs and resource usage, and improve the quality, efficiency, and effectiveness of urban services. When examining the suggested elements of smart cities, smart governance is one of the most important considerations. This is one of the reasons why smart cities must have good governance.

FEATURES OF SMART CITY

The main goal of a smart city / Need of Smart city - In every country, including India, cities are the main drivers of economic expansion. Approximately 31% of Indians reside in cities, while they account for 63% of the country's GDP (Census 2011). The population of India is expanding at a never-before-seen pace. By 2030, around 600 million Indians are predicted to reside in urban areas. By 2030, cities are expected to contribute more than 70% of India's domestic production create 70% of new jobs, and raise per capita income nationwide, according to a McKinsey Global Institute report. The infrastructure, energy consumption, and services provided by our cities are under unprecedented strain due to the world's population expansion and the ongoing migration of people from rural to urban areas. According to the United Nations Population Fund's 2011 World Population Report, the world's population is expected to rise from 7 billion people in 2011 to 9.3 billion by 2050 and 15 billion by 2100. In addition to this, 50% of people on Earth now live in cities, but in 35 years, that number will rise to 67%. Cities must improve if they are to be sustainable. This entails using their connected technological resources to advance citizen-centered solutions in the wireless age.

IMPLEMENTATION

SMART CITIES MISSION

The goal of the Smart City Mission is to raise living standards in all 100 Indian cities. The goal of smart cities is to lessen traffic, maintain safety, cut down on air pollution, encourage social contact and the local economy, etc.

On June 25, 2015, the Hon. Prime Minister launched the Smart Cities Mission. Through the use of "smart solutions," the mission's primary goal is to support communities that offer their residents a respectable standard of living, clean and sustainable environments, and essential infrastructure. Through extensive work on the city's social, economic, physical, and institutional pillars, the Mission seeks to promote economic growth and enhance quality of life. By developing reproducible models that serve as beacons for other aspirational cities, the emphasis is on equitable and sustainable development. After a two-phase competition, 100 cities were chosen to become Smart Cities.

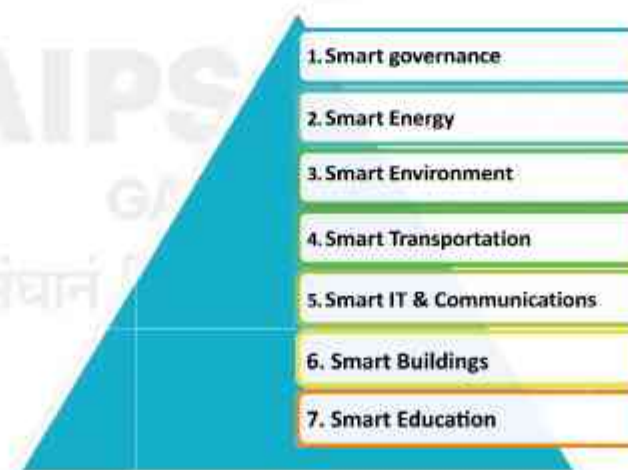
The Mission is run as a program that is sponsored centrally. Over the course of five years, the Central Government will provide financial support of Rs. 48,000 crores, or an average of Rs. 100 crore each city annually. In a matching fashion, the State/ULB must contribute an equivalent sum. Through convergence, more funds will be raised from ULB's own funds, grants from the Finance Commission, creative

financing methods like municipal bonds, other government initiatives, and borrowings. The business sector's involvement through public business Partnerships (PPP) has been emphasized. The chosen cities' Smart City Proposals (SCPs) reflected the desires of the populace. When taken as a whole, these proposals included approximately 5,000 projects totaling over Rs. 2,00,000 crores, of which 45% were to be financed by Mission funds, 21% by convergence, 21% by PPP, and the remaining portion from other sources.

The term "smart city" has no set definition or model. The idea of smart cities is founded on six core concepts in the context of our nation, and they are as follows:

- Community at the core
- More from Less
- Cooperative and Competitive Federalism
- Innovation, Integration, Sustainability
- Technology as means not the goal
- Convergence

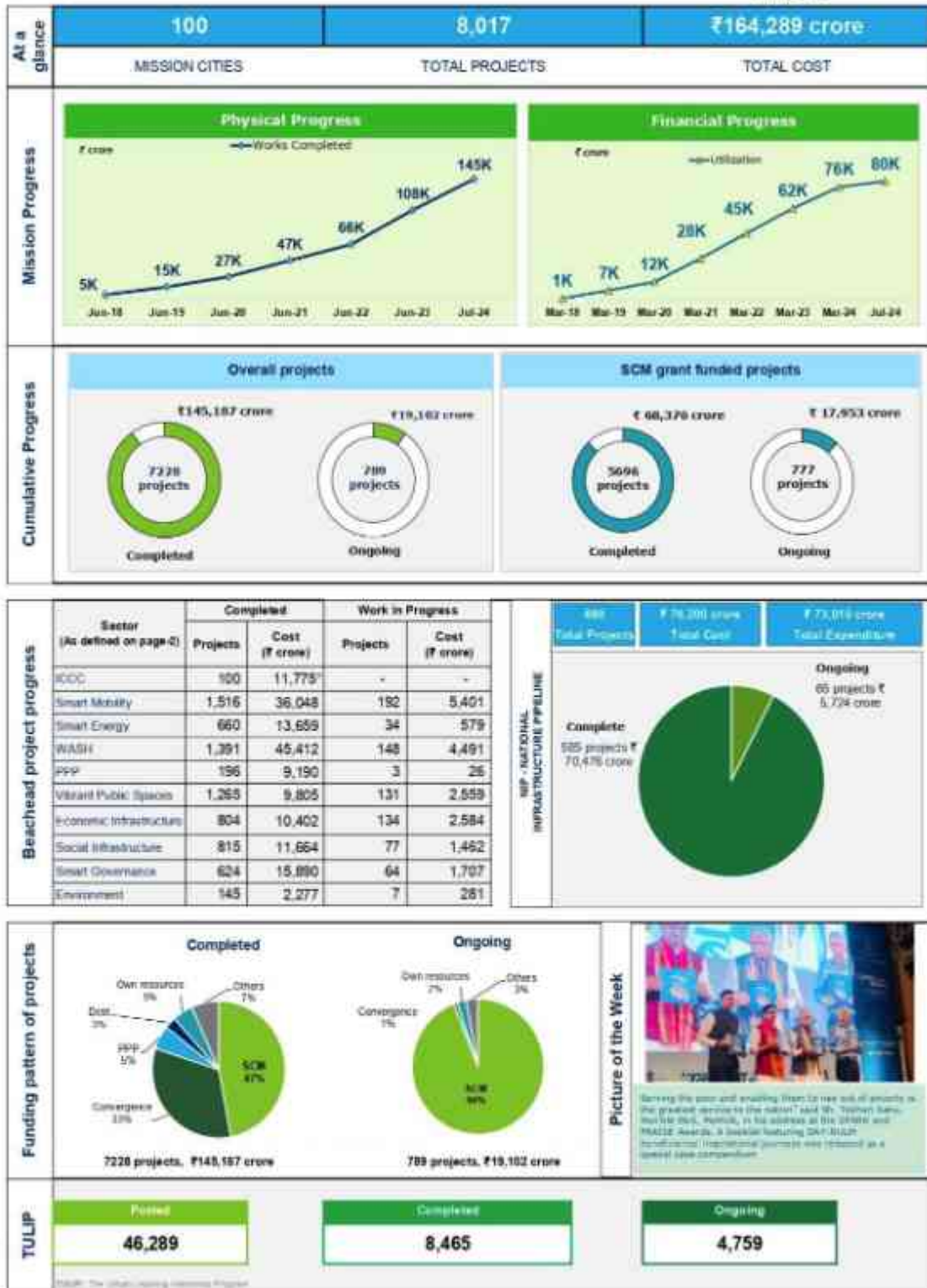
Therefore, these are the three main goals that a city must strive for in order to benefit its citizens. To put it another way, a smart city is a liveable, sustainable city with a healthy economy that gives its residents a variety of options to pursue their varied interests within the city. India's Smart City Program has eight essential pillars, which below





Smart Cities Mission

National Weekly Report
19 July 2024



Source: <https://smartcities.gov.in>, as on 19th July 2024

Regarding the Ministry's financial allocation, it has been reported that the Smart Cities Mission has already released Rs. 36,561 crores of the 48,000- crore total financial support for the Mission, of which Rs. 33,012 crores (or 90% of the total released) have been used by the smart cities. Of the 2,05,018 crores in total projects that 100 Smart Cities have undertaken, 7821 projects totalling Rs. 1,81,349 crores have been adopted by the 100 smart cities. As of February 15, 2023, 5343 projects totalling Rs. 1,00,450 crores had already been finished.

According to the Ministry, the top 10 cities are Greater Warangal, Aizawl, Guwahati, Amaravati, Diu, Imphal, Port Blair, Shillong, Puducherry, and Kavaratti, according to a thorough ranking system that considers not only physical progress but also financial progress, compliances, etc.

CHALLENGES

To ease the strain on the biggest urban centres and build up smaller towns and cities while better integrating them with their rural hinterlands, governments will need to create clear settlement programs. This will entail looking at and altering other policies that conflict with settlement techniques, such as those pertaining to taxes, food prices, transportation, health, and industrialization.

National governments and multilateral organizations are increasingly realizing that environmental and economic development issues are inextricably linked; environmental degradation can jeopardize economic development, and many types of development degrade the environmental resources that they must be founded on. For the goal of smart cities in their written response, the Ministry provided the following explanations for why projects hadn't been finished by the deadline and when they should have been finished:

Over the past 12 months, projects totalling Rs. 39,085 crores have been finished. This expedited project completion is significant since the cities were able to accomplish this in spite of various obstacles on the ground, including as the COVID-19 pandemic scenario, regional and political factors, and local labour and land related issues. Furthermore, the majority of cities and ULBs are creating these kinds of multi- sectoral urban projects for the first time (smart water and energy projects, ICCR projects, etc.). The Smart Cities Mission timeframe has been extended until June 2023 in light of these difficulties, and all Smart Cities are expected to finish their projects by that date.

The Union government has made a larger contribution to the Smart Cities Mission than have the states. Although states have been able to use the majority of the Union government's cash, their share of the funds has not been equal to that of the Union government. Between 2015 and 2022, the states' total contribution to the SCM was Rs 32,149.14 crore, while the Union government's contribution was Rs 36,561.16 crore, resulting in a Rs 4,481.82 crore deficit.

Experts attribute the slow progress of work and lesser contribution by their state governments, in smart cities in the northeast to lower levels of industrialization, a difference in priorities and the structure of their economy, given the topography.

CONCLUSION

In both rich and poor countries, many of the current initiatives to protect and uphold human progress, to satisfy human wants, and to fulfil human ambitions are just not sustainable. They deplete already overdrawn environmental resource accounts too rapidly and excessively to be sustainable for a long time without going bankrupt. On our generation's balance sheets, they might appear to be profitable, but the losses will be passed down to our descendants. We do not intend to pay back the environmental capital we borrow from future generations

About the Author

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THEME 7:

STRATEGIES TO TACKLE RADICALISATION IN PRISONS



HANDLING RADICALIZATION IN PRISONS - SUCCESS STORIES-A PILOT PROJECT ON DERADICALIZATION IN CENTRAL JAIL AMRITSAR

Shyamal Jyoti, PPS

INTRODUCTION

RADICALIZATION

It is a process of developing extremist beliefs, emotions, behaviours which are opposite to fundamental values of society, laws of democracy and universal human rights. Radical individual hold hateful and anti-social ideas. Radicalization results in violent extremism.

RADICALIZATION IN JAILS

Jails are becoming new focal points where criminals from different backgrounds involved in varied set of crimes, meet and form new relations and networks. Segregation of criminal minds from society by way of imprisonment leads to new set of problems like spread of criminal ideology, radicalization and forming networks in jails, operating from jails. Radicalization becomes a major problem and challenge for Police/Prison forces.

Early detection of radical minds and their proclivity to violent extremism in jails can help in preventing an entity from adopting extreme stance by medical counselling and psychiatric help in a scientific manner and ensuring prevention of spread of radical ideology in other prisoners.

Continuous engagement of jail inmates with psychiatrist/psychologists can aid in rationalizing their thought pattern, moderating their beliefs, helping in identification with positive role models, positive self talk, improving their value system and decriminalizing their mindset.

HISTORY OF RADICALIZATION & VIOLENT EXTREMIST

Extremist acts and the process of radicalizations got into researchers' attention worldwide since attacks on September 11th, 2001 on World Trade Centre in USA. Since then, significant efforts have been made in order to explore and better understand radicalized behaviours, especially terrorist acts. India too is facing the problem of violent extremism because of many religious-political organizations consisting of Hindus, Muslims, Sikhs and Christians.

One can easily remember the decade of 1980-1992 when Punjab was facing the serious problem of violent extremism and radicalization of Sikh youth especially because of multiple reasons.

In recent years, in Punjab, there were multiple instances of acts of Violent extremism like RPG Attack on Punjab Police Intelligence Head-Quarters, Mohali an RPG Attack on Police Station, Sarhali, Tarn Taran, Attack on Police Station at Ajnala, Amritsar by Radical Amritpal Singh along with his supporters.

Backward linkages of these crimes lead to many connections in Jails. India is also facing serious cross border terrorism from Pakistan which is infested with terrorists and so many organizations are training the youth in these extremist activities. In India also, government has always given response to eradicate such problems in jails. India is actively involved countering the extremism and radicalization.

WHAT IS VIOLENT EXTREMISM?

It is an extension of radicalisation from relatively benign expression of viewpoint to use of violence to achieve particular goal. It occurs when a person or group decides that fear, terror and violence are justified to achieve political, social goal and act accordingly. So violent extremism is ultimate expression of radicalisation. This results in harm to individual involved as well as to surroundings.

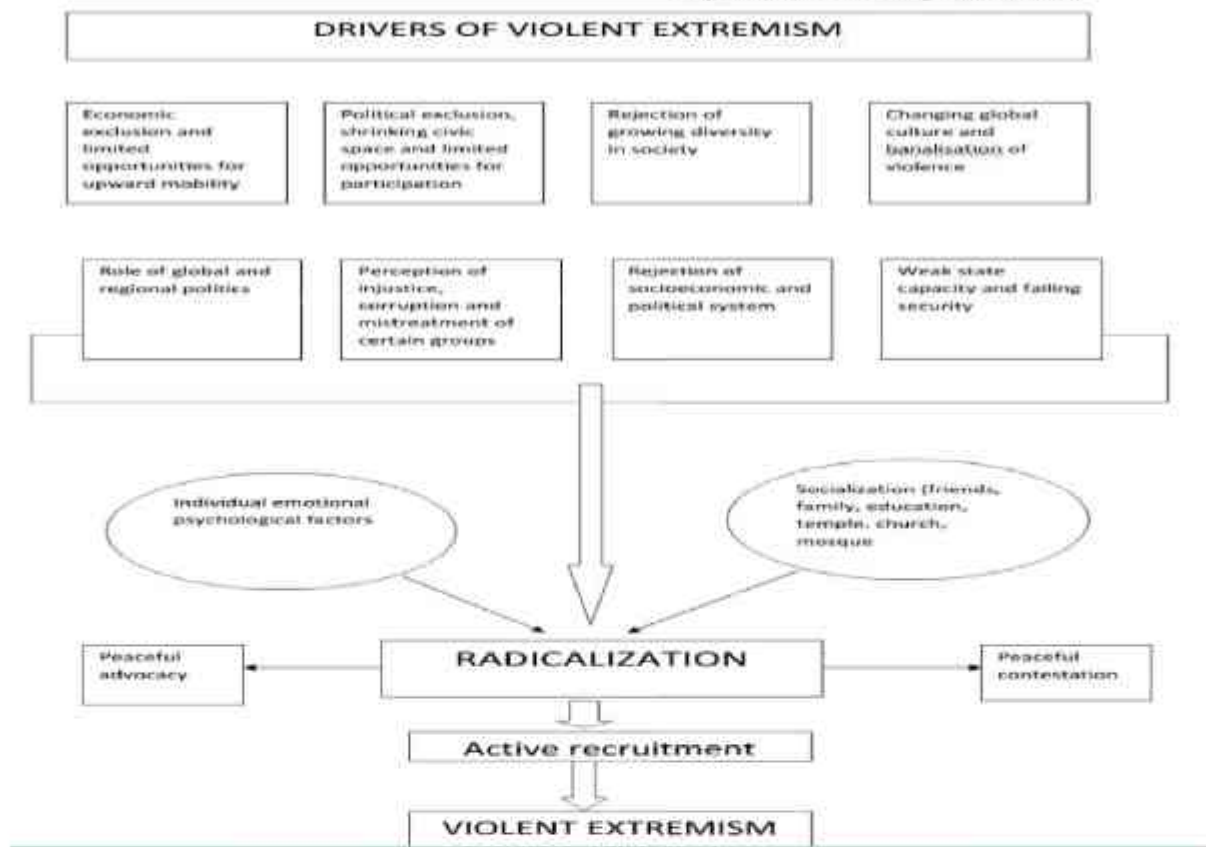
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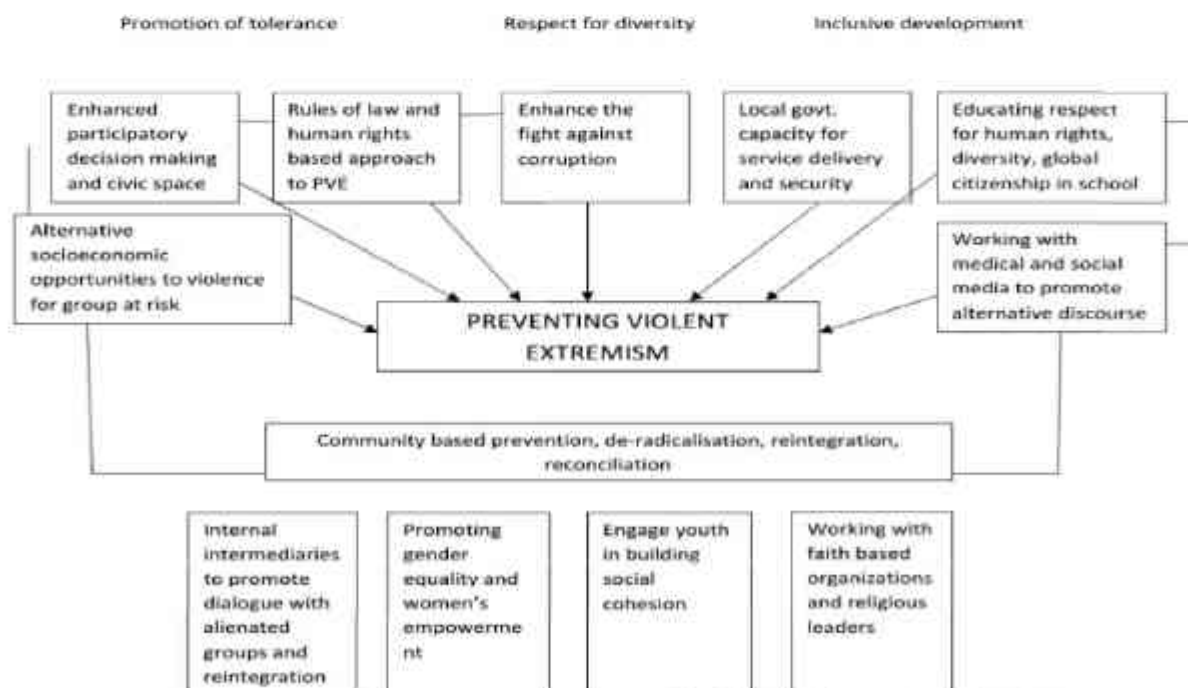
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RADICALIZATION & VIOLENT EXTREMISM

Adapted from UNDP- Preventing Violent Extremism



Prevention of Violent extremism



Adapted from UNDP- Preventing Violent Extremism

FORENSIC PSYCHIATRIC SERVICES IN JAILS

For screening the Radical elements and prisoners susceptible to radicalization, their Counselling, management and for providing necessary treatment, there was a need to provide Forensic Psychiatric services in Central Jail Amritsar, initially under a Pilot project. Under this project, a team of Psychiatrists including Associate Professors, Asstt. Professors, Sr. & Jr. residents and psychologists/Counselors from Deptt. of Psychiatry, Guru Nanak Dev, Medical College, Amritsar were roped in.

AIM OF THIS PROJECT

Aim of this pilot project is to segregate radical minds at the earliest so that spread of criminal ideology can be controlled. De-radicalization refers to a process of encouraging a person with extreme political, social or religious views to adopt more moderate positions on the issues. Continuous engagement of jail inmates with Psychiatrists/Psychologists can aid in rationalizing their thought pattern and beliefs.

OBJECTIVES

- De-radicalization of prisoners shortlisted.
- Addressing mental health issues associated.
- Treatment of psychiatric disorders and de-addiction services.
- Psychotherapeutic interventions.

PROCEDURE

Team consists of following members:

- Assistant professor
- Senior resident
- Junior resident
- Clinical psychologist

Shortlisted prisoners will be examined by using HCR 20 scale, Historical, Clinical (present), Risk Management (future). HCR 20 - It is a standardized tool for risk assessment for violence. This aims to mitigate risk of future violence by developing a plan of intervention.

This process is divided into following phases as below:

- A. Rapport establishment
- B. HCR-20 Scale application.
- C. Psychological Intervention.
- D. Family therapy.
- E. Rehabilitation.

Methodology of using HCR-20 Scale:

- Scales:
 - Historical Scale
 - Clinical Scale
 - Risk Management Scale
- Assessment was done by:
 - Identifying basic information of each patient
 - Psychosocial history
 - History of violent behaviour and violent ideation both past and recent
 - Historical factors
 - Clinical factors
- The patients were grossly assessed for
 - Psychiatric morbidities
 - Mental health issues and
 - Major mental disorders
- They were categorized into mild, moderate and high- risk cases to plan their interventions accordingly both in the form of psychosocial interventions & pharmacotherapy.

HCR-20^{VS} Rating Sheet for Version 3 of the HCR-20
Keith S. Douglas, Stephen D. Hart, Christopher D. Webster, & Henrik Sellberg

Name		Record Number											
DOB		Gender											
Nature/Purpose of Evaluation													
HCR-20 ^{VS} Items		Presence				Relevance							
		Omit	N	P	Y	Omit	L	M	H				
Historical Scale (History of problems with...)													
H1	Violence	☐	☐	☐	☐	☐	☐	☐	☐				
H2	Other Antisocial Behavior	☐	☐	☐	☐	☐	☐	☐	☐				
H3	Relationships	☐	☐	☐	☐	☐	☐	☐	☐				
H4	Employment	☐	☐	☐	☐	☐	☐	☐	☐				
H5	Substance Use	☐	☐	☐	☐	☐	☐	☐	☐				
H6	Major Mental Disorder	☐	☐	☐	☐	☐	☐	☐	☐				
H7	Personality Disorder	☐	☐	☐	☐	☐	☐	☐	☐				
H8	Traumatic Experiences	☐	☐	☐	☐	☐	☐	☐	☐				
H9	Violent Attitudes	☐	☐	☐	☐	☐	☐	☐	☐				
H10	Treatment or Supervision Response	☐	☐	☐	☐	☐	☐	☐	☐				
H11	Other Considerations	☐	☐	☐	☐	☐	☐	☐	☐				
Clinical Scale (Recent problems with...)													
		Rating Period											
C1	Insight	☐	☐	☐	☐	☐	☐	☐	☐				
C2	Violent Ideation or Intent	☐	☐	☐	☐	☐	☐	☐	☐				
C3	Symptoms of Major Mental Disorder	☐	☐	☐	☐	☐	☐	☐	☐				
C4	Instability	☐	☐	☐	☐	☐	☐	☐	☐				
C5	Treatment or Supervision Response	☐	☐	☐	☐	☐	☐	☐	☐				
C6	Other Considerations	☐	☐	☐	☐	☐	☐	☐	☐				
Risk Management Scale (Future problems with...)													
		Rating Period											
R1	Professional Services and Plans	☐	☐	☐	☐	☐	☐	☐	☐				
R2	Living Situation	☐	☐	☐	☐	☐	☐	☐	☐				
R3	Personal Support	☐	☐	☐	☐	☐	☐	☐	☐				
R4	Treatment or Supervision Response	☐	☐	☐	☐	☐	☐	☐	☐				
R5	Stress or Coping	☐	☐	☐	☐	☐	☐	☐	☐				
R6	Other Considerations	☐	☐	☐	☐	☐	☐	☐	☐				
Future Violence/Case Prioritization		Serious Physical Harm		Imminent Violence		Recommended Assessment Date							
☐ Low	☐ Moderate	☐ High	☐ Low	☐ Moderate	☐ High	☐ Low	☐ Moderate	☐ High	YY/MM/DD				
Evaluator		Signature				Date							

© 2013 by the Mental Health, UK, and Policy Institute, Joseph Fourier University.

Mild risk cases: No need of special intervention.

Moderate risk cases: increased monitoring, special management strategy needed, treatment of underlying psychopathology if any.

High risk cases: increased frequency of monitoring, treatment, regular reassessment, multiple counselling sessions needed.

BENEFITS OF THE PROJECT

- A. Making individuals to take responsibility for themselves.
- B. Developing positive identity and ideology.
- C. Enabling individuals to express, tolerate and cope up with powerful emotions without harming others.
- D. Improving quality of life in jail inmates.
- E. Helping radical individuals to handle their shortcomings and ego weaknesses.

PILOT PROJECT AT CENTRAL JAIL AMRITSAR

Active coordination was done with Deptt. of Psychiatry, Amritsar for developing Pilot project on De-radicalisation in Prisons. Initially a list of 41 prisoners (list of identified radicals + List of prisoners who are at risk of radicalisation) was shared with Deptt. of Psychiatry, Amritsar.

A visit was made by H.O.D. Deptt. Of Psychiatry in Central Jail Amritsar, and a list of requirement for project was shared.

Required Equipment & Literature was purchased & received in Central Jail Amritsar. A separate room having required facilities was provided to team for Pilot project. Proper security was provided. Visits of De-rad programme were initiated by Psychiatry Deptt. By this time, out of initial shared list of 41 prisoners, Initial assessment of all prisoners started with completion of HCR (Historical, clinical and Risk-management scale) performa.

50 prisoners were shortlisted and subjected to psychiatric counseling which can help in screening of inmates for radical ideology by studying potential behavior indicators as per protocols, identifying likely underlying psychiatric issue and prescribing corresponding treatment for improving the mental health and promote rehabilitation.

Team visited the jail twice a week, dedicating 04 hours on each day. Each patient required nearly 30 minutes of assessment in one session.

In one month, first counseling session of 50 prisoners was undertaken. Repeat sessions are proposed to be held monthly till the patient shows signs of improved mental health.

Phase-2 of this programme is started in August 2023. Now, a list of 50 prisoners including previous ones (involved in crimes under UAPA Act and Attacking & instigating violence at Police Station Ajnala, Amritsar) was shared with Deptt. of Psychiatry, Amritsar. Team of Deptt. of Psychiatry is now making visits to Central Jail Amritsar on regular basis and initially a schedule of visits is prepared. Screening and assessment of prisoners is being done and necessary interventions regarding treatment will be carried out at the end of this schedule.

It is submitted that since the start of 2nd phase of Initial assessment in De-radicalisation programme i.e. from the month of August 2023 to March 2024, a total of 56 sessions of De-radicalisation programme were held at Central Jail Amritsar by team of Psychiatrist Counsellors of Department of Psychiatry, Govt. Medical College, Amritsar.

Till now, in this Pilot project, assessment and reassessment of a total of 50 prisoners (07 from previous phase and 43 newly added during start of 2nd Phase of Assessment) is completed using HCR scale. Out of these 50 prisoners, 05 prisoners are out of this jail now and remaining 45 are presently lodged in this Jail.

As per combined report received from Central Jail Amritsar and Professor and Head of Dept. of Psychiatry, GMC, Amritsar (date 16.05.2024), the team has successfully completed the first and second phase of pilot project by assessing 50 inmates using HCR-20 scale. The assessment was done in multiple sessions on the basis of the HCR-20 performa and the inmates were divided into two groups.

1. High Risk for violence (14 Inmates)
2. Low Risk for violence (36 Inmates)

The team has started 3rd and 4th phase during which psychological intervention is being done in low-risk inmates by deputing counselors. Counselors are doing family therapy by having one to one sessions with families. Interventions done in low risk inmates are appearing beneficial as inmates are motivated for behaviour change especially after family therapy. Psychological intervention is to be done in high risk inmates after personality assessment by clinical psychologist.

Further progress can be seen after completion of 4th and 5th phase & after the pending work of personality assessment of high-risk inmates. The Institute of Mental Health, Amritsar has been requested to provide a clinical Psychologist for the personality assessment for the inmates found to be High Risk of violence.

CURRENT OUTCOMES

- a. Interventions done in low-risk inmates are appearing beneficial as inmates are motivated for behaviour change especially after family therapy.
- b. Psychological intervention is to be done in high-risk inmates after personality assessment by a clinical psychologist.
- c. Due to the segregation of prisoners enrolled under the program and their timely identification, the further spread of radical extremist ideas can be checked upon.
- d. Further progress can be seen after the completion of the 4th phase, 5th phase & after the pending work of personality assessment of high-risk inmates.
- e. If Pharmacotherapy is advised by the team, further legal interventions shall be explored for its implementation.

About the Author

The author is the Superintendent of Central Jail, Kapurthala with extensive experience in correctional administration. The author acknowledges the assistance of the Department of Psychiatry, Government Medical College, Amritsar, in conducting this study.

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HANDLING RADICALISATION IN PRISON- SUCCESS STORIES

Tinny Kapoor

ABSTRACT

Prisons, intended for rehabilitation, are increasingly becoming breeding grounds for radicalisation and recruitment by terrorist groups. They often play a significant role in the emergence and growth of extremist movements, as vulnerable inmates – such as ‘identity seekers,’ ‘protection seekers,’ and ‘rebels’ – are targeted for radicalisation. Radicalisation in prison is a notable concern as it drives individuals towards adopting extremist belief and engaging in terrorist activities after release. This paper examines the radicalisation process in prisons, identifies factors facilitating it, and emphasizes the need for effective deradicalisation strategies to counteract extremist ideologies. It also explores legal frameworks related to terrorism and evaluates the success of counter radicalisation and deradicalisation efforts, including those implemented by the Indian government.

INTRODUCTION

Radicalisation is not a new or isolated phenomenon, but rather a gradual process that unfolds over time, involving multiple interconnected pathways that shape extremist beliefs, emotions, and behaviours. This process can occur at the individual, group, or societal level and leads to significant shifts in attitudes, beliefs, behaviours, goals, and ideologies, often culminating in extreme positions. In the context of prisons, radicalisation refers to the process by which inmates adopt more extremist views and may become more likely to engage in terrorist activities upon their release. Essentially, radicalisation is a dynamic process in which individuals increasingly accept and support violent extremism.

Radicalisation in prison is a serious issue, as it can result in individuals embracing extremist ideologies and potentially engaging in terrorist activities upon their release. Resolution 2396 (2017) United Nations Security Council (UNSC) recognized that the prison can serve as a political indicator for radical terrorism and terrorist recruitment and encouraged the member countries to take appropriate actions to prevent inmates who have been convicted of terrorism-related offences from radicalising other prisoners, with whom they may come into contact in compliance with domestic and international law. Radicalisation comes from the word "radical," which, like "terrorism," has undergone shifts in meaning over the decades. "Radicalism" is a concept that varies within society, influencing the definitions of radicalisation, deradicalisation, and counter-radicalisation.

According to EU Commission on Migration and Home Affairs, radicalisation is a facet and complex process in which an individual group embraces a radical ideology or believe that accepts, uses or condones, violence, includes act of terrorism, to reach a specific political or ideological purpose.

RADICALISATION IN PRISONS PRESENTS SEVERAL THREATS:

- **Recruitment of Vulnerable Individuals:** Prisons house individuals who might be susceptible to extremist ideologies, As a result of insufficient social support, trauma, or mental health challenges.
- **Formation of Radical Networks:** Radicalised inmates can form networks that plan and execute terrorist activities.
- **Spread of Extremist Ideology:** Prisons can amplify extremist beliefs, influencing both inmates and those outside.
- **Increased Risk of Terrorist Attacks:** Radicalised individuals released without proper rehabilitation may engage in violent extremism.
- **Radicalisation is a process and it occurs in phases.** There are several theories regarding the process of radicalisation to violence cycle. One prominent theory suggests that radicalisation to violence cycle is composed four steps Each stage is unique, and a violent extremist may never progress to the final step. Radicalisation to violence cycle can be understood in four distinct stages:
- **Pre-radicalisation:** This initial phase involves personal crises, feelings of discrimination, or social and economic deprivation that create vulnerabilities. In prison, these factors can be amplified, leading individuals to seek new belief systems or ideologies.
- **Identification:** In prison, isolation, and exposure to extremist ideologies lead individuals to adopt a new identity aligned with violent extremism. They start to align themselves with extremist causes and beliefs.
- **Indoctrination:** The individual becomes deeply immersed in a group environment that reinforces extremist views. They are vetted and monitored by other extremists, solidifying their commitment and preparing for active participation.
- **Action:** The individual engages in violent extremist activities, which can include recruiting others, facilitating extremist activities, and planning or executing violent acts, both inside and outside the prison

The factors driving radicalisation to violence in prisons are as follows:

- ❖ **Incarceration:** Psychological stress from imprisonment can make inmates vulnerable to radicalisation by hard-core criminals.

- ❖ **Overcrowding and Poor Conditions:** Overcrowding, poor living conditions, and understaffing increase isolation and despair, creating opportunities for extremist recruiters to exploit these conditions. Bad run prison, make the detention of radicalisation difficult, and they also create the physical and ideological space in which extremist recruiters can operate at free will and monopolise the discourse about religion and politics.
- ❖ **Exposure to Extremist Ideologies:** Contact with inmates holding extremist beliefs can introduce others to radical ideologies that justify violence.
- ❖ **Lack of Rehabilitation Programs:** Insufficient rehabilitation programs can lead to hopelessness, making inmates more susceptible to extremist ideologies.
- ❖ **Isolation from Society:** Disconnection from mainstream society can foster feelings of alienation, increasing vulnerability to extremist beliefs.

HANDLING RADICALISATION IN PRISON

To address the threat of radicalisation in India, it is essential to foster interfaith harmony, tolerance, and respect for diversity. The government and civil society organizations should collaborate to offer education and employment opportunities to vulnerable communities, encourage positive social norms, and monitor online counter-terrorism propaganda. Furthermore, law enforcement agencies should focus on identifying and tracking extremist groups and individuals, taking proactive measures to prevent them from engaging in savage activities. To address radicalisation in prisons effectively, it is crucial to implement targeted rehabilitation and prevention measures. Strategies to prevent radicalisation and support inmates' successful reintegration into society are: -

1. Conducting Risk Assessments to identify those at risk of radicalisation, allowing for tailored interventions.
2. Educate by offering programs to tackle underlying issues such as social exclusion, mental health challenges, and inadequate education. By apprising information on the dangers of extremism.
3. Tracking inmate communications by monitoring visitors, mail, and phone calls to identify and address extremist messages or behaviours
4. Collaborate with external organizations to provide ongoing support and rehabilitation during and after incarceration.
5. Post-Release Support by implementing programs that aid reintegration into society, including education, job, mental health support, and community engagement.

It is quite essential to learn about the environment of prison and very important to check if the same environment is conducive to breeding radicalisation among the

prisoners. The prison environment, in particular, poses a potential risk for radicalisation due to the following factors:

1. recruitment of other prisoners
2. supporting extremist group from prison
3. getting support from extremist getting support from extremist groups outside prison
4. preparing for violent extreme/ideological inspired illegal act after release
5. hostility to other groups of prisoners and many/or staff
6. becoming more radical because of grievances/frustration/anger related to being in prison

To prevent radicalisation in prisons, the UNODC has laid certain recommendations that are as follows: -

- I. Develop National Strategies: Create comprehensive strategies targeting radicalisation with preventive and rehabilitative measures.
- II. Train Staff: Equip prison staff with skills to identify and address radicalisation.
- III. Use Risk Assessment: Implement tools to identify prisoners at risk of radicalisation.
- IV. Provide Rehabilitation: Offer programs focusing on cognitive-behavioural therapy, education, and vocational training.
- V. Encourage Dialogue: Promote open communication among prisoners to counteract extremist ideologies.
- VI. Share Intelligence: Improve cooperation and information exchange between facilities and agencies.
- VII. Involve Families: Engage families and communities in the rehabilitation process.
- VIII. Address Grievances: Tackle systemic issues and grievances that may contribute to radicalisation.
- IX. Monitor Programs: Regularly assess and adjust anti-radicalisation efforts for effectiveness.
- X. Respect Human Rights: Ensure all measures uphold prisoners' human rights and dignity.

In India, deradicalisation programs are not entirely new. The Indian Armed Forces, through their outreach initiatives, have addressed issues like healthcare, religious affairs, and financial stability, and have been engaged in "broad deradicalisation efforts" via community outreach. In 2015, the Prime Minister Sh. Narendra Modi appointed former Intelligence Bureau (IB) Chief Saif Ibrahim as the Special Envoy for

Counter Terrorism under the National Security Council Secretariat (NSCS). His role was to liaise with countries in West Asia, Afghanistan, and Pakistan, working closely with the National Security Advisor (NSA). A key responsibility was to design a new counter-radicalisation program for state governments and other agencies. In 2014, then Home Minister Sh. Rajnath Singh prioritized internal security, leading to the creation of the Counter Terrorism and Counter Radicalisation Division (CT-CRD) within the Ministry of Home Affairs, especially following the rise of ISIS as a global threat.

The main bodies within the Indian government handling issues related to radicalisation, counter-radicalisation, terrorism, and counter-terrorism are the Counter Terrorism and Counter Radicalisation (CTCR) division of the Ministry of Home Affairs. The CTCR is responsible for interpreting and implementing two key pieces of legislation: the National Investigation Agency (NIA) Act of 2008 and the Unlawful Activities (Prevention) Act (UAPA) of 1967.

The Unlawful Activities (Prevention) Act (UAPA) was enacted to enable more effective prevention of unlawful activities by individuals and organizations involved in terrorist activities. The UAPA is the chief legislation used to address terrorism and related offenses in India. It has undergone several amendments to enhance its effectiveness in combating terrorism.

KEY PROVISIONS UNDER UNLAWFUL ACTIVITIES (PREVENTION) ACT:

Definition of Terrorism (Section 15): It defines terrorism and includes acts carried out with the intent to threaten the sovereignty, integrity, or security of India.

Section 16: Punishment for Terrorist Acts: This section outlines the penalties for committing terrorist activities and stipulates that those convicted of terrorist acts may face life imprisonment or the death penalty, depending on the severity of the act and its consequences.

Section 18A: Punishment for Harboursing, Concealing, or Assisting Terrorists: This section criminalizes the act of harbouring, concealing, or assisting individuals who are engaged in terrorist activities. It aims to penalize those who provide support or shelter to terrorists. Offenders can be imprisoned for a term of up to 10 years, along with a possible fine.

Section 18B: Punishment for Recruiting Terrorists: This section targets individuals or organizations that recruit people to join or support terrorist activities. It is intended to disrupt the process of radicalisation and recruitment for terrorism. Those found

guilty of recruiting terrorists can face imprisonment for up to 10 years, with the possibility of additional fines.

The NIA Act created the National Investigation Agency (NIA), which is tasked with investigating and prosecuting terrorism-related cases. The NIA has the authority to address terrorist activities nationwide without needing special permission from individual states

KEY PROVISIONS UNDER THE ACT

Jurisdiction (Section 6): Confers the NIA jurisdiction to investigate and prosecute terrorism-related offenses throughout India.

Powers (Section 11): Empowers the NIA to arrest, investigate, and prosecute individuals involved in terrorism.

Marking a significant shift in the criminal justice system, The Bharatiya Nyaya Sanhita, 2023 has incorporated provisions and sub-clauses from Unlawful Activities (Prevention) Act, a special act, explicitly defining a 'terrorist act' within a penal statute.

Section 113 (1) of the Bharatiya Nyaya Sanhita defines terrorist acts and associated penalties. A terrorist act, as defined by the Act, is an act committed with the intent to threaten India's sovereignty, integrity, and security, or to intimidate the public and disrupt public peace and order.

Section 113(4) of the Act outlines the punishment for organizing camps that provide training for terrorist activities or for recruiting people to commit acts of terrorism.

Section 113(6) deals with harbouring or concealing terrorist act by stating that anyone who harbours or conceals, or attempts to harbour or conceal, a person involved in a terrorist act is punishable with 3 years to life imprisonment and a fine of at least ₹5 lakhs. This does not apply to the spouse of the offender.

SUCCESS STORIES OF DE-RADICALISATION STRATEGIES

Maharashtra

The deradicalisation program in Maharashtra, run by the state's Anti-Terrorism Squad (ATS), aims to counter extremist ideologies, particularly among vulnerable youth in minority communities. Launched in 2016, under the guidance of India's Union Home Ministry, the program incorporates a wide array of strategies, including

setting up Vyayam Shalas (exercise centers) in Muslim-majority areas, encouraging participation in national organizations like the Bharat Scouts and Guides, and establishing an independent media outlet to promote mainstream values. One notable success of the program has been its ability to encourage parents to report their children if they suspect involvement in extremist activities. By fostering trust between local communities and police, the program has created a preventive mechanism that helps identify individuals potentially susceptible to radicalisation. The program's outreach efforts have focused on areas such as education, sports, law enforcement, healthcare, and social justice, with the aim of reintegrating radicalized individuals into society.

In 2019, the ATS reported that 114 men and six women had been successfully reintegrated through the program after being lured by ISIS, and 200 others had been counseled. The success is partly attributed to the fact that many police officers are from the local communities, which helps establish trust and openness. This approach is one of several similar initiatives worldwide that aim to combat radicalisation through community engagement, education, and counselling.

Maharashtra has implemented several initiatives aimed at deradicalizing inmates, particularly those involved in terrorism-related cases. The Model Prisoner Rehabilitation Program focuses on providing educational and vocational training, along with psychological counselling.

Kerala

In 2016, Kerala launched its deradicalisation program, which has achieved significant success. The northern districts of the state, in particular, have seen several cases linked to ISIS. The Kerala State Police's "Operation Pigeon" has been credited with preventing the radicalisation of 350 youths by proactively monitoring social media and intervening before they could be influenced by extremist ideologies. 'Operation Pigeon' was aimed at preventing youngsters from "falling prey to the propaganda of organization such as Islamic States, Indian Mujahideen and Lashkar -e-Taiba"

Jammu and Kashmir

In Jammu and Kashmir, the Indian Army and Jammu and Kashmir Police jointly launched an initiative called 'Sahi Raasta' as part of their efforts to counter radicalisation. Under this program, over 130 youngsters participated in a 21-day program at a specialized center, where they receive counseling on both religious perspectives and career development. Launched in 2022 in Pattan, Baramulla district, the program expanded with additional centers later opening in Anantnag. Encouragingly, of the 180 individuals who participated in the program, only one young man joined militant ranks, but he returned within a week.

The "Jail Reformation" Project in Uttar Pradesh

In Uttar Pradesh, the Jail Reformation Project has incorporated deradicalisation efforts as part of broader prison reforms. This project includes training for prison staff, mental health support for inmates, and educational programs.

Deradicalisation programs in prisons have seen varying degrees of success across different countries. Here are a few notable concise success stories:

- ❖ Germany: The "Islamist Prevention Program" combines psychological support, education, and reintegration efforts, helping individuals disengage from extremist ideologies.
- ❖ Saudi Arabia: The "Saudi Rehabilitation Program" integrates religious re-education, psychological counseling, and vocational training, leading many former jihadists to successfully reintegrate and renounce violence.
- ❖ Indonesia: The "Deradicalisation and Rehabilitation Program" offers counseling and religious education, leading to successful reintegration of former militants into society.
- ❖ United Kingdom: The "Prevent" strategy and "Channel" program provide support and intervention for at-risk individuals, with success stories of former extremists reintegrating and advocating against terrorism.
- ❖ Norway: The Norwegian Prison and Probation Service's tailored rehabilitation strategy has successfully helped radicalized inmates reintegrate into society.

India's approach to combating radicalisation through its prison system is still developing, with fewer high-profile success stories compared to more established programs in other countries. To improve prison-based deradicalisation efforts, several recommendations should be taken into consideration:

- Improving prison conditions: Address overcrowding, train staff, and offer meaningful programs to help inmates build stable identities.
- Manage interactions: Prevent vulnerable prisoners from associating with extremists and supervise interactions carefully.
- Implement Interventions: Provide tailored theological, motivational, and behavioural programs for hard-core prisoners.
- Integrate Reform: Incorporate deradicalisation efforts into broader prison reform plans.
- Develop Aftercare: Create targeted post-release programs to reduce recidivism.
- Protect human rights: Ensure all measures adhere to international human rights standards and provide staff training on human rights-based treatment.
- By focusing on aforesaid areas, prisons can better prevent radicalisation and aid in the reintegration of former prisoners.

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FROM ISOLATION TO EXTREMISM: UNDERSTANDING THE RADICALISATION OF SEXUAL OFFENDERS IN KOLKATA CENTRAL JAIL

Ms. Ridhi Banerjee, Dr Moirangmayum Sanjeev Singh

ABSTRACT

Radicalisation within prison settings poses a significant threat to societal security, transforming correctional facilities from places of reform into potential incubators for extremist ideologies. This study focuses on the complexities of handling radicalisation among sexual offenders and accused individuals in Calcutta Central Jail. Utilizing primary data collected through in-depth interviews with inmates, the research examines the drivers of radicalisation, including socio-economic vulnerabilities, psychological factors, and prison dynamics. The findings indicate that, while sexual offenders are generally less prone to radicalisation compared to those accused of violent crimes, the lack of rehabilitative and psychological support systems worsens the risk of exposure to extremist ideologies. This study contributes to the limited body of literature on radicalisation among non-violent offenders and offers critical insights into the intersection of sexual offending and susceptibility to radicalisation. It underscores the urgent need for targeted intervention strategies within correctional facilities, such as the implementation of de-radicalisation programs, psychological counseling, and structured rehabilitation activities. By addressing these issues, prisons can better fulfill their role as institutions of correction rather than becoming breeding grounds for extremist ideologies. The implications of this research extend beyond the prison walls, as the effective management of radicalisation within correctional facilities is vital for societal safety and the prevention of recidivism. A comprehensive approach that includes intelligence sharing, community reintegration programs and post-release monitoring is essential to mitigate the risks associated with radicalised individuals re-entering society. By implementing these strategies, we can work towards a safer, more resilient society, where the cycle of crime and radicalisation is effectively broken.

INTRODUCTION

Radicalisation among sexual offenders and accused individuals in prisons is a nuanced issue, influenced by various ideologies that intersect with their vulnerabilities and the broader socio-political context (Bryans, 2016). While sexual offenders may not typically be the primary target for radical groups, the harsh prison environment, combined with the social stigma attached to their crimes, can make them susceptible to radicalization under certain circumstances. Here are some key ideological pathways through which radicalization may occur in this group:

1. **Religious Extremism and Promise of Redemption:** Radical groups may exploit religious beliefs to provide a sense of purpose and redemption to sexual offenders, who often suffer from deep guilt and social ostracism (Bryans, 2016). They might use distorted interpretations of religious texts to justify their actions or to convince them that they are being unfairly punished by a society

that discriminates against them. For sexual offenders, the offer of religious redemption can be particularly appealing. Radical elements may promise spiritual salvation and acceptance within their group, portraying their incarceration as an opportunity for spiritual cleansing and renewal.

2. **Anti-establishment narratives and Revenge ideology:** Sexual offenders often feel alienated and marginalized both within the prison system and in society at large. Radical groups may exploit these feelings by portraying the state and legal system as corrupt and unjust. They may argue that the offenders are victims of a flawed system, thereby fostering resentment against the state and mainstream societal norms. This narrative can evolve into a desire for revenge against the perceived oppressors, which may lead offenders to embrace extremist ideologies that promote violence against state institutions or certain communities.
3. **Personal identity crisis and psychological manipulation:** Sexual offenders often struggle with self-identity, especially given the intense social stigma attached to their crimes. Radical groups can exploit this identity crisis by offering a new, radicalized identity that provides a sense of belonging and purpose, often under the guise of being part of a larger, 'righteous' struggle. Extremist recruiters may use psychological manipulation, exploiting the guilt, shame, or isolation felt by sexual offenders to coach them into radical ideologies. They may also use threats or promises of protection to coerce compliance.
4. **Ideological Exploitation of Personal Grievances:** Many sexual offenders have histories of personal trauma, abuse, or socio-economic deprivation. Radical ideologies that highlight systemic injustices or propose revolutionary changes can appeal to these personal grievances. By framing their personal suffering within a broader narrative of social or political struggle, recruiters can draw offenders into extremist networks. In the Indian context, many sexual offenders come from marginalized communities that face caste-based and socio-economic discrimination. Radical groups may exploit these grievances, aligning them with broader ideological struggles against the dominant societal structures.
5. **Political Extremism:** Depending on their background and the influences within the prison, some sexual offenders may be drawn to left-wing ideologies that advocate for the overthrow of the state as a solution to their grievances. Conversely, others may be attracted to right-wing extremism, especially if they believe their crimes were a result of moral decay or societal degradation caused by specific groups. In a multi-religious and multi-ethnic society like India, communal tensions are often exploited by radical groups. Sexual offenders may be radicalised into seeing their actions as part of a larger communal conflict,

thus justifying their crimes and aligning them with violent, extremist ideologies.

The radicalisation of sexual offenders poses a significant risk to society, as it not only undermines the rehabilitative goals of the prison system but also increases the likelihood of these individuals engaging in extremist activities post-release (Bryans, 2016). This can lead to a cycle of violence, where offenders become more dangerous after their incarceration, posing a threat to social stability and safety. Managing radicalization among sexual offenders is particularly challenging because their pathways to radicalization may differ significantly from those of other inmates, such as those convicted of terrorism or political crimes. The prison environment, with its overcrowding, lack of adequate psychological support, and the stigma associated with their crimes, can aggravate their vulnerability to radicalisation. Understanding the specific ideological pathways through which sexual offenders may become radicalized is crucial for developing effective intervention strategies. Tailored de-radicalization programs, psychological support, and monitoring are essential to mitigate this risk (Council of Europe handbook of prison and probation services regarding radicalisation and violent extremism, 2016). By addressing these issues comprehensively, the criminal justice system can help prevent the spread of extremist ideologies within prisons and ensure that released individuals do not pose a threat to societal peace and security.

Tapan Barman's case is a disturbing example of reoffending under the Protection of Children from Sexual Offences (POCSO) Act, 2012 (Tapan Barman v. State of West Bengal, 2014). Barman was arrested in 2012 for sexually assaulting a 10 year-old girl and was charged under sections 4 and 6 of the POCSO Act. Despite being granted bail in 2013, Barman reoffended, sexually assaulting another minor girl. Investigations revealed that during his imprisonment, Barman was radicalized by extremist ideologies, which exacerbated his violent tendencies and contributed to his reoffending. Prison authorities noted that Barman's interactions with fellow inmates and exposure to radical literature fuelled his hatred towards society, particularly children. The Calcutta High Court cancelled Barman's bail, citing the seriousness of the offense and the likelihood of reoffending. This case underscores the risks of prison radicalization and its link to reoffending, emphasizing the need for effective de-radicalisation programs, stricter bail conditions, and enhanced monitoring of high-risk offenders.

Indian prison authorities have implemented successful rehabilitation programs for sexual offenders, focusing on transformation and reintegration into society (Suman O, 2023). Initiatives like Tihar Jail's Sex Offender Rehabilitation Program, Mumbai's Arthur Road Jail Sex Offender Treatment Program, Kerala's 'Saksham' Program, Gujarat's 'Pravah' Program, Rajasthan's Sex Offender Rehabilitation Initiative, and Punjab's 'Sangrahi' Program have shown promising results. These programs combine counselling, therapy, education, and vocational training to address underlying issues

and promote positive behavioural change. Notable success stories include the rehabilitation of a convicted rapist who became a skilled baker and a child sex offender who underwent counselling and therapy, leading to successful reintegration. Moreover, targeted rehabilitation programs in Indian prisons play a crucial role in preventing radicalization by addressing the root causes of offending behaviour and promoting positive psychological transformation. Programs like Andhra Pradesh's Sex Offender Treatment Programs (SOTPs), Karnataka's "Jeevan Adhar," Maharashtra's specialized rehabilitation programs, and Delhi's Tihar Jail's Project 'Sakhi' provide cognitive-behavioural therapy, psychological counselling, behaviour modification therapy, and vocational training to address distorted thinking patterns, aggression, and emotional instability. By fostering a rehabilitative environment, these initiatives counter radicalization risks and promote mental stability, resilience, and reintegration into society.

This study investigates radicalisation among sexual offenders in Indian prisons, revealing critical insights into its complexities. Exposure to radicalising materials and ideologies significantly contributes to radicalisation, while psychological vulnerabilities, social isolation, and peer relationships also play a crucial role. Existing rehabilitation programs demonstrate limited effectiveness, highlighting the need for tailored interventions addressing radicalisation risks. Prison staff and social networks have a pivotal influence, emphasizing the importance of staff training and positive peer relationships. Targeted interventions, such as cognitive-behavioural therapy, mindfulness-based programs, and vocational training, show promise in reducing radicalisation risks and promoting desistance.

RESEARCH OBJECTIVES

1. To assess the prevalence of exposure to radicalizing material among offenders accused of sexual offenses and under POCSO.
2. To determine the extent of radicalization among this group.
3. To identify whether a significant relationship exists between exposure to radicalizing material and the likelihood of being radicalized.

HYPOTHESIS

- Null Hypothesis (H0) - There is no significant association between exposure to radicalization material and the likelihood of being radicalized.
- Alternative Hypothesis (H1) - There is significant association between exposure to radicalization material and the likelihood of being radicalized.

RESEARCH METHODOLOGY

RESEARCH DESIGN

The study adopts a quantitative research design to investigate the relationship between exposure to radicalizing material and the extent of radicalization among

offenders accused of sexual offenses and those under the Protection of Children from Sexual Offences (POCSO) Act in Calcutta Central Jail. A chi-square test of independence is utilized to statistically analyze the association between these variables.

SAMPLE SELECTION

1. **Population:** The study focuses on offenders and accused individuals incarcerated in Calcutta Central Jail under allegations of sexual offenses and POCSO cases.
2. **Sample Size:** A total of 100 participants were selected for the study.
3. **Sampling Technique:** Purposive sampling was used to select participants based on their charges under sexual offenses and POCSO to ensure relevance to the research questions.
4. **Inclusion Criteria:**
 - Offenders and accused individuals charged with sexual offenses and POCSO cases.
 - Inmates who have been in custody for at least six months, ensuring sufficient exposure to the prison environment.
 - Participants who consented to be part of the study.
1. **Exclusion Criteria:**
 - Individuals with charges unrelated to sexual offenses or POCSO.
 - Those unwilling or unable to participate due to health or psychological reasons.

DATA COLLECTION METHODS

1. **Structured Questionnaire:** A structured questionnaire was developed to collect data on two primary variables: exposure to radicalising material (independent variable) and the presence of radicalized behaviour or beliefs (dependent variable). The questionnaire included:
2. **Exposure to Radicalising Material:** Measured using a series of yes/no questions regarding access to radical literature, media, or influence from radicalized individuals within the prison.
3. **Radicalisation Status:** Determined using behavioural indicators such as changes in ideology, participation in extremist groups, or the expression of radical views.

DATA ANALYSIS

4. **Chi-Square Test of Independence:** The chi-square test was applied to examine the association between exposure to radicalizing material and the status of being radicalized or not. The null hypothesis (H_0) stated that there is no

significant relationship between exposure to radicalizing material and radicalization status, while the alternative hypothesis (H1) posited that a significant relationship exists.

5. Data Categorization:

- Exposure: Categorized as “Exposed” or “Not Exposed.”
- Radicalization Status: Categorized as “Radicalized” or “Not Radicalized.”

6. Data Analysis Process:

- A contingency table was created to cross-tabulate the two variables.
- The chi-square test was performed to determine if the observed frequencies significantly differed from expected frequencies under the null hypothesis.
- The p-value was calculated to assess the significance level (typically $p < 0.05$).

Table 1 Inmates exposed to radicalizing materials are whether radicalized or not.

Exposure to Radicalizing Materials	Radicalized	Not Radicalized	Total
Yes	30	10	40
No	15	45	60
Total	45	55	100

Source: Primary Data as collected from the inmates through interviews.

This table explains the relationship between exposure to radicalizing materials and radicalisation status among inmates of Kolkata Central Jail, based on data collected through interviews. It categorizes 100 inmates into four groups: those exposed to radicalising materials who are radicalised (30) and not radicalised (10), and those not exposed who are radicalised (15) and not radicalised (45). The row totals indicate that 40 inmates were exposed, while 60 were not. The column totals show that 45 inmates are radicalised and 55 are not. The table is used to assess whether exposure to radicalising materials is associated with a higher likelihood of radicalisation, which can be statistically tested using the chi-square test.

RESULTS AND DISCUSSIONS

1. Chi-square value (χ^2): 24.242
2. p-value: 0.00000237
3. Degrees of Freedom (df): 1

4. Expected Frequencies: $E = \frac{\text{(row total)} * \text{(column total)}}{\text{grand total}}$

E represents the value of the expected count for that cell under the assumption that there is no association between row and column variables.

1. Exposed, Radicalized: 18
2. Exposed, Not Radicalized: 22
3. Not Exposed, Radicalized: 27
4. Not Exposed, Not Radicalized: 33

The calculated chi-square value and the very low p-value indicate a significant association between exposure to radicalising material and the likelihood of being radicalized among the inmates studied. The p-value (0.00000237) is significantly lower than the conventional threshold of 0.05, indicating that there is a statistically significant association between exposure to radicalising material and the likelihood of being radicalised. Here the null hypothesis is rejected and it is concluded that the alternative hypothesis is true. This suggests that those exposed to radicalising factors are significantly more likely to be radicalised compared to those who are not exposed. Radicalisation among sexual offenders in prisons is a complex issue, influenced by factors including exposure to extremist ideologies, inadequate rehabilitation programs, social isolation, and charismatic leaders or peer groups. Inadequate rehabilitation programs, overcrowding, poor living conditions, and limited access to education and vocational training exacerbate feelings of frustration and disillusionment, while extremist ideologies provide a sense of purpose and identity. Individual characteristics such as mental health issues, low education levels, or prior extremist involvement increase susceptibility. Indicators of radicalization include changes in behaviour, increased isolation, extremist rhetoric, and symbolic expressions of allegiance. Effective intervention requires enhanced monitoring, targeted rehabilitation programs, staff training, positive peer relationships, and offender self-reflection, enabling Indian prisons to mitigate radicalization risks, promote rehabilitation, and ensure safer communities.

ETHICAL CONSIDERATIONS

7. Informed consent was obtained from all participants, ensuring they were aware of the study's purpose, their voluntary participation, and the right to withdraw at any time.
8. Confidentiality was maintained by anonymizing data and ensuring that no personal identifiers were linked to the responses.
9. Ethical approval was secured from the Institutional Ethics Committee and the prison authorities prior to conducting the study.

LIMITATIONS OF THE STUDY

10. The study relies on self-reported data, which may be subject to social desirability bias, potentially underestimating the true extent of exposure or radicalization.
11. The sample size, while adequate for chi-square analysis, may limit the generalizability of the findings to the broader population of sexual offenders under POCSO in other settings.
12. The study is confined to a single prison, which may not fully represent the diversity of experiences in other correctional facilities.

This methodology provides a systematic approach to understanding the potential relationship between exposure to radicalising material and the extent of radicalisation among sexual offenders and accused individuals under POCSO in Calcutta Central Jail. The use of the chi-square test allows for a rigorous statistical examination of this relationship, contributing to the development of targeted interventions to prevent radicalization within the prison system.

CONCLUSION

This study highlights the complex relationship between exposure to radicalising material and the likelihood of radicalisation among sexual offenders in Indian prisons, underscoring the importance of addressing radicalisation risks within correctional facilities to ensure community safety and successful rehabilitation. While prisons face challenges, recent initiatives demonstrate their commitment to combating radicalisation, including de-radicalisation programs, enhanced psychological support, vocational training, and intelligence sharing. Despite progress, limitations persist, such as resource constraints, overcrowding, and social isolation. To build on successes, it is essential to continue investing in evidence-based rehabilitation, foster interagency collaboration, and develop effective counter-narratives. To effectively address radicalisation, prisons must adopt a multifaceted approach incorporating enhanced rehabilitation, staff capacity building, positive peer influences, effective risk assessment, and community reintegration support, ultimately mitigating radicalisation risks and promoting safer communities. By acknowledging both successes and challenges, we can create safer, more rehabilitative environments, supporting the development of effective strategies to counter radicalization and promote safer communities and successful rehabilitation. This research aims to inform evidence-based policies, interagency cooperation, and community engagement, ultimately contributing to a safer and more resilient society.

SUGGESTIONS

- **Cognitive-Behavioural Therapy (CBT) Modules:** Develop tailored CBT programs addressing distorted thinking patterns, emotional regulation, and empathy development.

- **Restorative Justice Programs:** Implement victim-offender mediation, focusing on accountability, remorse, and reparation to promote healing and desistance.
- **Mindfulness-Based Interventions:** Integrate mindfulness practices to reduce stress, improve emotional regulation, and enhance self-awareness.
- **Inclusive Recreation Activities:** Organize sports, art, and cultural programs promoting socialization, teamwork, and positive identity formation.
- **Mentorship Initiatives:** Pair offenders with positive role models, providing guidance, support, and constructive influence.
- **Family Reintegration Programs:** Facilitate regular family visits, counseling, and communication skills training to strengthen social bonds.
- **Vocational Training and Entrepreneurship:** Offer skills training, business planning, and micro-financing support to promote economic stability and purpose.
- **Counter-Narrative Campaigns:** Develop and disseminate alternative narratives challenging extremist ideologies, and promoting inclusive values and national pride.
- **Post-Release Support Networks:** Establish community-based support groups, monitoring, and mentoring to ensure successful reintegration and reduce recidivism.
- **Interagency Collaboration:** Foster partnerships between prisons, NGOs, community organizations, and mental health professionals to leverage resources and expertise.
- **Prison Staff Training:** Provide training for prison staff on radicalization prevention, response, and rehabilitation strategies.
- **Risk Assessment Tools:** Implement evidence-based risk assessment tools to identify vulnerable individuals and tailor interventions.
- **Inter-Faith Dialogue Initiatives:** Promote religious tolerance and understanding through inter-faith dialogue, education, and cultural programs.
- **Reflective Journaling Programs:** Encourage offender self-reflection through journaling and expressive writing to facilitate personal growth and rehabilitation.

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THEME 8:

COMMUNITY POLICING IN TRIBAL AND BORDER AREAS



BUILDING TRUST AND BRIDGING CULTURES: AN ANALYSIS OF EFFECTIVE COMMUNITY POLICING IN TRIBAL AREAS

Shri RC Sharma, Dr Ishita Sharma

ABSTRACT

Criminal investigations do not always lead to solving of crime. Crimes are solved either by swift response of the police or a police informer or an individual who comes up with identifying the suspect. Police detectives obtain information from a web of informers and suspects, directly or indirectly linked to the crime to furnish evidence of crime. This shows that community plays a crucial role in solving crimes. The police has to rely on the members of the community in which the crime occurs in successfully engaging in solving crimes. However, a hostile and sceptical citizenry, is highly unlikely to help the police in providing information. Thus, community policing is a concept wherein the police and the communities' they are policing share a symbiotic relationship. The author through analytical methodology, with aid of successful case studies focusing on tribal areas, in India argues that community policing is not an ambiguous innovative concept but a lucid model with certain programmatic elements. Finally the author argues that there is a dire need to give statutory force to section 85 of Model Police Act that embraces the rehabilitative model of community policing in India.

INTRODUCTION

"The police are the public and the public are the police."

- Sir Robert Peel (The Police Federation of England and Wales, n.d.)

As far as crime is concerned, the twin variables of perception and fear of crime share a unified global response of prevention as well as retribution i.e. to penalize the offender severely and prevent potential crimes through their incarceration (*Theme and Variation in Community Policing on JSTOR*, 1988). As far as the data on prison population is concerned, since 2000 the World Prison Population has grown by 27 % (Fair & Walmsley, 2024). As far as India is concerned, the prison population in India has grown by a staggering 111% since 2000 (Fair & Walmsley). The global data on prison population can also be illustrated graphically (United Nations, 2024).

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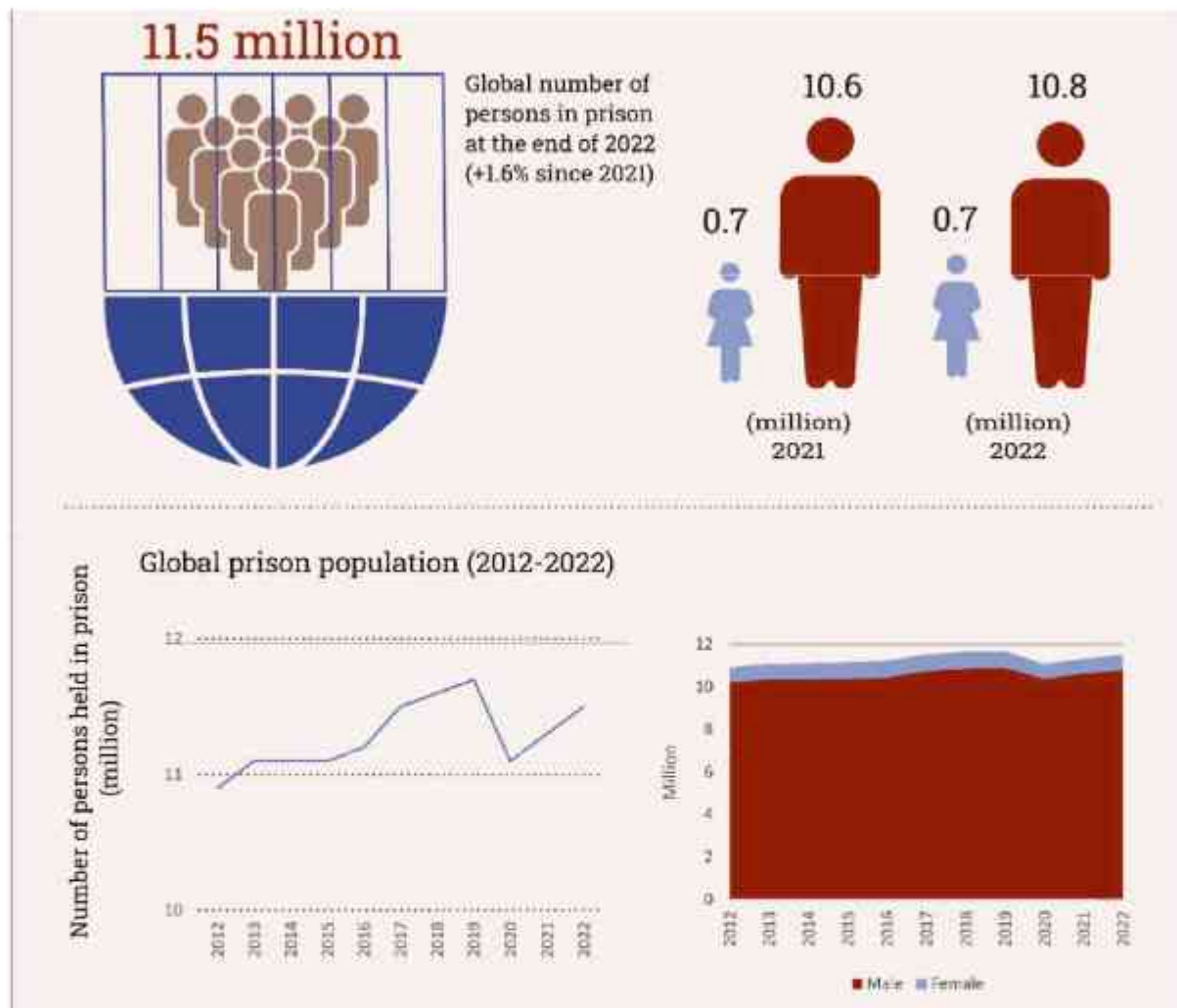


Figure1

Source : UNODC, Prison Matters 2024: Global Prison Population and Trends; A Focus on Rehabilitation

The Covid-19 pandemic witnessed a brief hiatus in the burgeoning of prison population. However, post the pandemic, there has been a steady spike in prison population with 11.5 million incarcerated population as of 2022, a 5.5% decadal growth. This zeroes down to every 144th individual out of every 100,000 being incarcerated as of 2022. As far as the Indian position is concerned the table below succinctly portrays the same (*India | World Prison Brief, n.d.*) राष्ट्रसेवार्थम्

Country	India
Ministry responsible	Ministry of Home Affairs
Prison administration	Governments of States and Union Territories
Prison population total (including pre-trial detainees / remand prisoners)	573 220 at 31.12.2022 (National Crime Records Bureau)
Prison population rate (per 100,000 of national population)	41 based on an estimated national population of 1,413,144 million at end of 2022 (from United Nations figures)
Pre-trial detainees / remand prisoners (percentage of prison population)	75.8% (31.12.2022) Further information
Female prisoners (percentage of prison population)	4.1% (31.12.2022) Further information
Juveniles / minors / young prisoners incl. definition (percentage of prison population)	0.0% (31.12.2022 - under 18)
Foreign prisoners (percentage of prison population)	1.1% (31.12.2022)
Number of establishments / institutions	1 330 (31.12.2022 - comprising 148 central jails, 428 district jails, 574 sub jails, 34 women's jails, 91 open jails, 10 Borstal schools, 42 special jails, 3 other jails)
Official capacity of prison system	436 266 (31.12.2022)
Occupancy level (based on official capacity)	131.4% (31.12.2022)

Figure 2

Source: India | *World Prison Brief*. (n.d.). *World Prison Brief*

The above data, shows the incarceration level at 131.4%, which includes the pre-trial population comprising 75.8% of the total prison population. This shows an inclination towards the retributive as well as prevention model of crime prevention which raises very pertinent questions : Are there any fool proof strategies to prevent crime? Are there any policies that can lower crime rates? Has higher levels of incarceration lowered crime? The answer to these questions is highly subjective as well as, there is a dearth of literature with corroborative data on the subject . However, the above data shows that there is a proclivity towards prevention as evident through over incarceration rates despite no credible data existing justifying its co-relation to reduced crime rates. This has spurred police executives around the world to look towards alternative models of crime prevention. There is also a consensus that there are limitations that all police departments face in fighting crime. There is also no evidence that incidence of crime is reduced through adherence to conventional models of policing (Skolnick & Bayley, 1986).

Rehabilitative model is being explored as an alternative to mitigate the incidence of crime in the society. This has led to police executives globally from London, Oslo, Singapore, India etc. to explore *community policing* as means to deter the occurrence

of crime. The phrase community policing is comprised of two words, community and policing. A google search of the meaning of these two words brings up the following results,⁶⁷

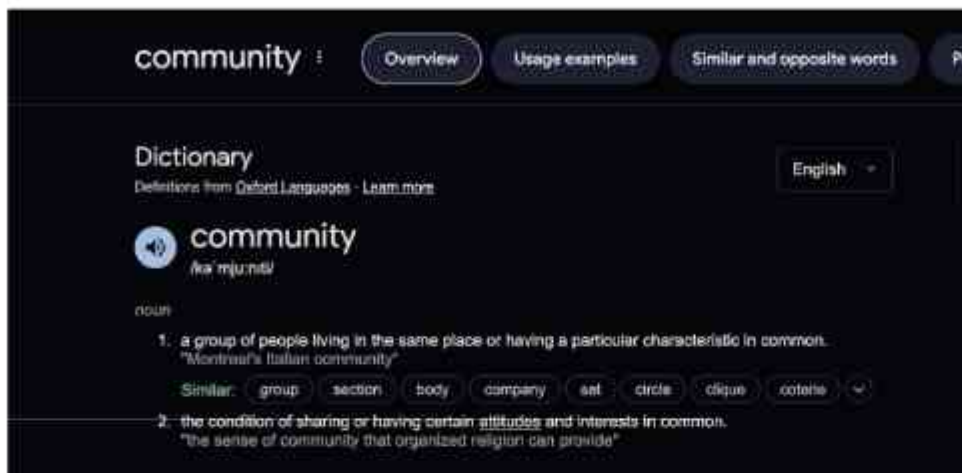


Figure 3

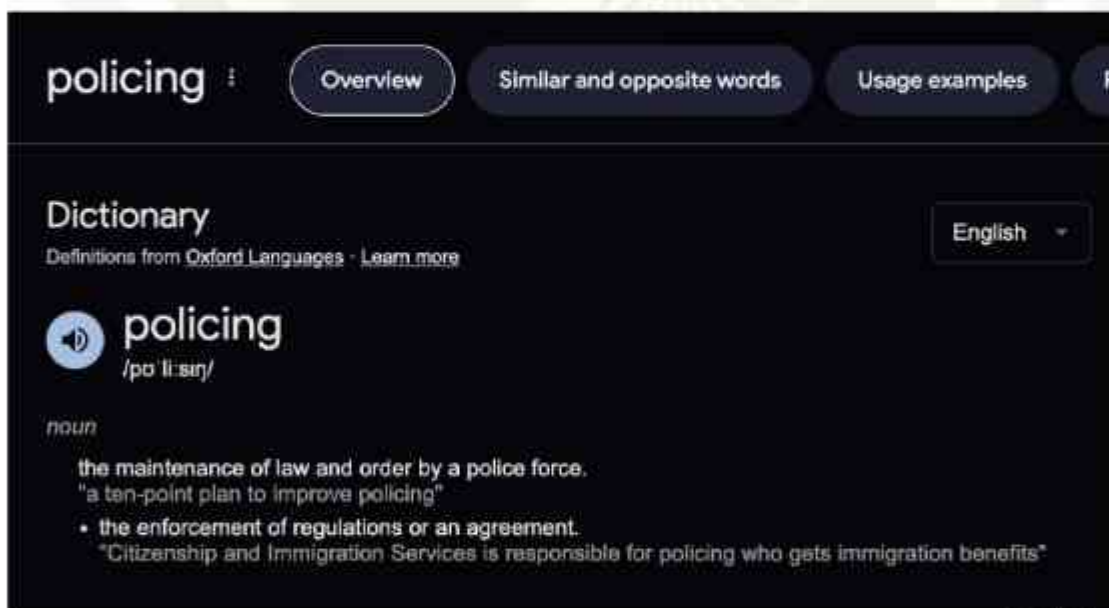


Figure 4

Source : These are screenshots taken by the author as of June 2024, generated as a result of typing the keywords community meaning and policing meaning in Google search box.

Thus, on the basis of the results above, community policing can be defined as a concept where the members of a particular group, living in a particular area are actively

⁶⁷ These are screenshots taken by the author as of June 2024, generated as a result of typing the keywords community meaning and policing meaning in Google search box.

involved in the maintenance of law and order. The concept of community policing has been highly subjective depending upon the idea of policing existing in a particular society at a particular point of time (Allender, 2004). Conventional police officers might envision a possibility wherein there is a transition from a formal emergency response interaction to an informal engagement with the citizens focusing on collaborating with the citizens towards the maintenance of law and order in the society. On the other hand, the members of the community might conjure up images of police personnel engaging in one-on-one contact with the citizens, informal discussions on day to day problems encountered by the citizens. To an administrator, it is another alternative innovative model, highly pliable to generous funding for its implementation. Thus, a precise mathematical definition of the term *community policing* is an onerous task.

Criminal investigations do not always lead to solving of crime (Skolnick & Bayley, 1988). Crimes are solved either by swift response of the police or a police informer or an individual who comes up with identifying the suspect. The famous detectives of Sir Arthur Canon Doyle, Holmes & Watson picked up minute traces of crime to corroborate evidence. Similarly, police detectives obtain information from a web of informers and suspects, directly or indirectly linked to the crime to furnish evidence of crime. This shows that community plays a crucial role in solving crimes. The police has to rely on the members of the community in which the crime occurs in successfully engaging in solving crimes. However, a hostile and sceptical citizenry, is highly unlikely to help the police in providing information (Chathas et al., 1977).

Thus, community policing is a concept wherein the police and the communities' they are policing share a symbiotic relationship. The symbiosis of cooperation between the uniformed and the non-uniformed is the essence of community policing. The author in the first section of the paper elaborates on the evolution and the core components of community policing. The author in the second section of the paper, through analytical methodology, with aid of successful case studies focusing on states' with high tribal population such as Chattisgarh, Andhra Pradesh, in India argues that community policing is not an ambiguous innovative concept but a lucid model with certain programmatic elements. Finally the author argues that there is a dire need to give statutory force to section 85 of Model Police Act that embraces the rehabilitative and collaborative model of community policing in India.

COMMUNITY POLICING : MAPPING THE JOURNEY TO ITS CORE COMPONENTS

John E. Angell in his seminal work titled, '*Toward an alternative to the classic police organizational arrangements :A democratic model*' elucidates that the organization of police is structured, defined as *structural model* whose roots go back to the Anglo

Saxon era under the aegis of Metropolitan Police Act, which started the London *bobbies* in 1829 (Angell, 1971). This model is premised on the classic organizational theory which has been in place, even prior to the twentieth century (Angell). India's administrative set up being a colonial legacy, the organization of police is premised upon this model. The salient features of this model are as under:-

- A formal centralized hierarchical chain of command
- Division of labour based on functional specialisation
- A Standard Operating Procedure (hereinafter referred to as SOP) for every activity.
- Pre-charted career routes with a common entry point and promotions based on an impersonal appraisal system by the superior.
- Organization of management based on a monocratic subordinate superior relationship
- Employee status premised on his/her designation.

However, with the changing scenario and dynamics of society Angell (1971) suggested an alternative model based on the three pillars of flexibility, participation and sensitivity to socio-cultural setup. The model termed as *democratic policing* in Angell's terms is a departure from autocratic operationalisation of police. It is democratic, in the sense there is participation of the two prime stakeholders of law and order, i.e. police and community. The essence of the model is enhanced decision making and consensus building through increased facilitation of information exchange between the citizens and the police. Community Policing is a blueprint of democratic policing.

As far as India is concerned, the genesis of community policing lies in the recommendations of National Police Commission Report of 1971, particularly the Seventh Report, wherein concept of community policing has been dealt with under chapter IX titled Home Guards (Government of India, 2005). The major recommendations were:-

- Supplement the police force through use of Home Guards
- Enhanced facilitation of community in policing through their use.
- They would aid in mitigating crime at a micro level being local residents
- They would serve for a period of three year
- Voluntary participation

Further, the Padmanabhaiah Committee on Police Reforms recommended community policing through the use of *village policing* (Government of India, 2005). On the lines of the recommendations, a Model Police Act of 2006 was drafted which under Section

85⁶⁸ and Section 86⁶⁹ provides for community policing in the form of Community Liason Groups. In lieu of the same, the Government of India (hereinafter referred to as GOI) set up National Police Mission with six Micro Missions (hereinafter referred to as MM) under its ambit. MM 2 deals with community policing through operation of decentralized beat policing system (Choudhary & Bureau of Police Research & Development, 2012). Furthermore, the Bureau of Police Research & Development has undertaken a number of projects under MM2 for senior citizens, slums, women, children to strengthen the foundations of community policing, recommending several interventions to the states under the aegis of Police-Community Partnership, an umbrella mode of community policing (Bureau of Police Research & Development, 2019).

Thus, the twin pillars of community policing are as under:-

- **Community Partnership:** A symbiotic relationship with the community where police and community are coproducers of crime prevention is the fundamental premise of community policing. A partnership that transcends conventional methods of law enforcement. Instances of cooperation can be provisions for emergency medical services, helping traffic accident victims, coordination with Resident Welfare Associations in betterment of neighborhood and localities etc. The same can be illustrated as under (Bureau of Justice Assistance, 1994)

⁶⁸ "Community Liason Group The District Superintendent of Police shall constitute a Community Liaison Group for each Police Station, comprising respectable local residents of the area with unimpeachable character and antecedents, including retired public servants and heads of teaching institutions, if any, as representatives of the community, to generally advise the police in their functioning. The Community Liaison Group shall have a fair representation of gender, and all other segments and professions, of the society in villages falling in the Police Station area. The Community Liaison Group shall have two representatives nominated by each Panchayat Samiti in the jurisdiction of the concerned Police Station from amongst its members:

Provided that no person convicted by a court of law or against whom charges have been framed by a court of law in a criminal case, or dismissed, removed, discharged or compulsorily retired from any employment on grounds of corruption, moral turpitude or misconduct shall be eligible to be inducted into the Community Liaison Group. *Provided further* that no person who is connected with any political party or an organisation allied to a political party, other than the nominated representatives of the Panchayat Samitis, shall be eligible to be inducted into the Community Liaison Group."

⁶⁹ "The Community Liaison Group will identify the existing and emerging policing needs of the area, which will be taken into consideration by the Station House Officer while preparing the annual policing strategy and action plan for his jurisdiction, for submission to the District superintendent of Police. The Community Liaison Group shall perform such other functions as prescribed. It will meet as frequently as necessary, and at least once in each quarter of a year. The meetings of the Community Liaison Group shall be attended by the Sub Divisional Magistrate and Sub-Divisional Police Officer as well as the officer in charge of the Police Station and the Circle Inspector. The meetings shall be open to public."

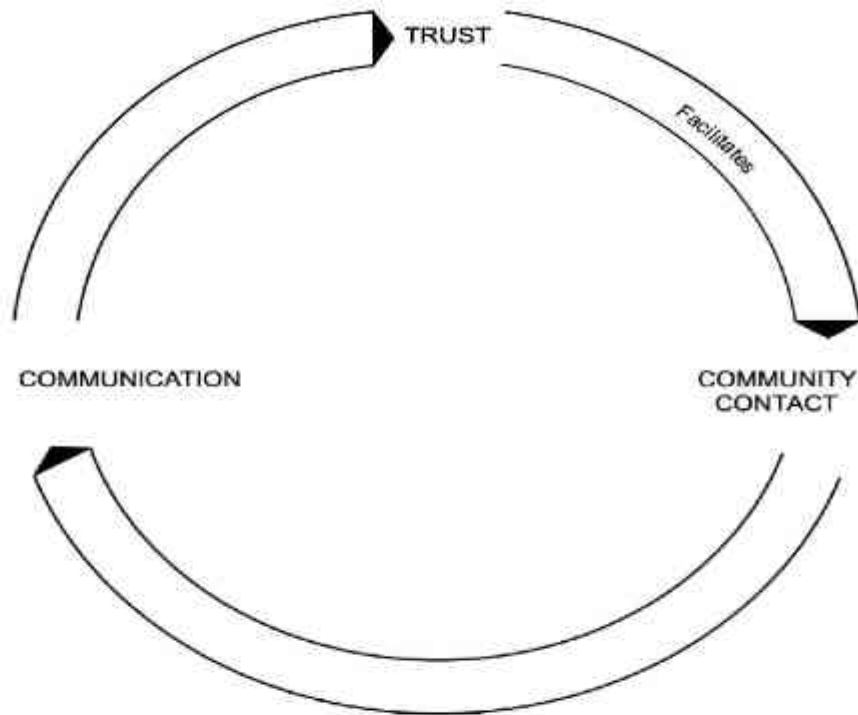


Figure 5

Source: Bureau of Justice Assistance, Office of Justice Programs, US Department of Justice

- Problem Solving:** Problems are a manifestation of the socio cultural context in which they are set in. They depend upon variables such as the kind of people involved, the social circumstances surrounding them, their environment etc. Thus, every incident is unique. For example, the residents of a dilapidated apartment complex, with a dearth of basic necessities might resort to burglaries, vandalism, harassing pedestrians in the adjacent areas (Eck, 1987). Thus, problem solving involves careful examination of the demography and geography of the area compounded by the problem and channelising the resources accordingly to solve the same. The same can be illustrated as under (Bureau of Justice Assistance, 1994)

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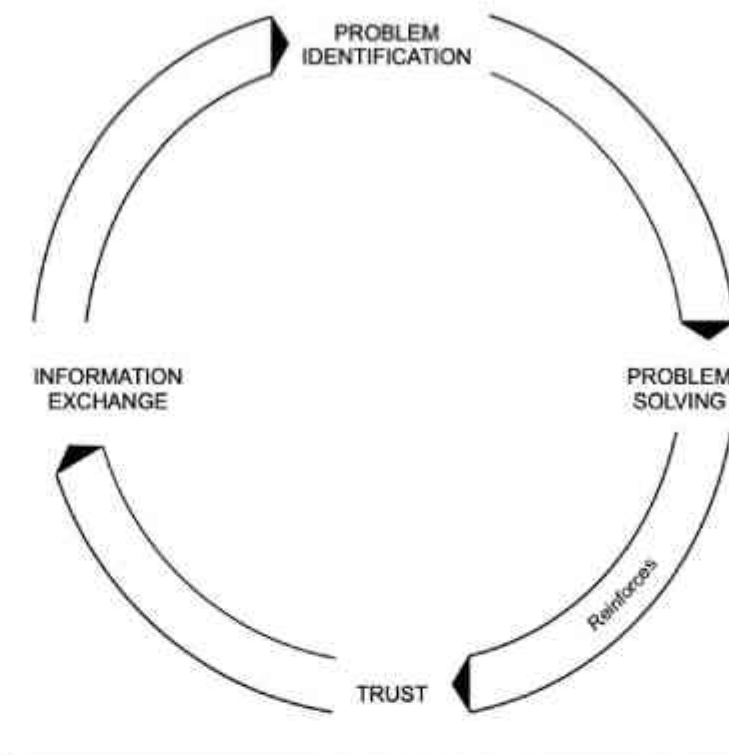


Figure 6

Source: Bureau of Justice Assistance, Office of Justice Programs, US Department of Justice

After an insight into the evolution of community policing globally as well as in India along with an elucidation of its core components, the author shall cite successful case studies of MM2 in tribal belts of India as well as other jurisdictions with corroborative evidence that community policing aids in better maintenance of law and order.

COMMUNITY POLICING AS A PRAGMATIC MODEL OF POLICE-CITIZENRY COLLABORATION: AN ANALYSIS

According to Crime in India Report 2022 published by National Crime Records Bureau (hereinafter referred to as NCRB), GOI, the various states and union territories of India witnessed 58,24,946 registration of cognizable crimes, out of which 35,61,379 were under the Indian Penal Code (hereinafter referred to as IPC) and 22,63,567 under Special and Local Laws (hereinafter referred to as SLL) (National Crime Records Bureau, 2023). As far as Metropolitan cities are concerned, out of 8,53,470 cognizable crimes registered, 6,20,356 crimes were under IPC and 2,33,114 crimes were under SLL (National Crime Records Bureau, 2023). The crime rate witnessed a decline of 10.4% in comparison to 2021 in metropolitan areas. These figures highlight that alternative models of policing, a detour from conventional methods to reduce rates of crime, can be effectively explored to deter the prevalence of crime through social cohesion and

amicability. This also will help to break the typical stereotypical intimidating aura of law enforcement agencies' that has clouded citizen-police relationship.

The project whose roots go back to 2008 was initiated to make police and the society, coproducers in prevention of crime. The same has been done through Beat Officers and Janamaithri Suraksha Committees. Another successful community policing programme is of Chattisgarh Police (Student Police Cadet Programme, n.d.).



Image 7

Source : Student Police Cadet Programme. (n.d.). *Community Policing in India* [Slide show]. https://spc.gov.in/SPC-Training-presentations?s_ppt=PO637714618678830904

The programme launched in 2009 aimed at reaching out to the villagers of Bastar district with the aim to combat the scourge of naxalism with the cooperation of the local community. The success of the model can be gauged from the fact that it led to the Bastar police bagging the special recognition award in the category of *Homeland Security* at the annual International Association of Chiefs of Police (hereinafter referred to as IACP) in 2017 (Drolia, 2017). This project is a successful testimonial of amicable community-police relationship to establish peace and harmony in restive tribal regions such as Bastar.



Bastar SP Arif Shaikh becomes the only IPS officer to have won this prestigious award in Community Policing twice in a row.

Image 8

Source Bastar police bags "Oscar" in community policing. *The Times of India*. <https://timesofindia.indiatimes.com/city/raipur/bastar-police-bags-oscar-in-community-policing/articleshow/61226525.cms>

The award which is touted as the biggest award of community policing is also known as the *Oscar of policing* has also brought laurels to the state of Chattisgarh.

The state through visionaries like Mr. Sheikh have successfully integrated community policing to cover intersectional issues such as women empowerment, digital empowerment, road safety etc in Balod, Bilaspur and Bastar districts of Chattisgarh. (Contributor, 2019).



Image 9

Source This IPS officer's Record-Setting initiatives are reducing crime & much more! *The Better India*. <https://thebetterindia.com/174766/ips-hero-bastar-crime-reduction-initiatives/>

Sheikh's initiative was noted by the Guinness Book of Records which felicitated him for enabling women's empowerment with the concept of 'Rakhi with Khaki' in 2018.



Image 10

Source This IPS officer's Record-Setting initiatives are reducing crime & much more! The Better India. <https://thebetterindia.com/174766/ips-hero-bastar-crime-reduction-initiatives/>

Mission Jeevdya



Image 11

The above images are a documentation of successful initiatives of community policing in tribal state of Chattisgarh. Mission Jeevdaya or Sympathy towards life caters to the victims of road accidents in the crucial initial period of 30 minutes. The programme was successfully implemented in Balod wherein highly accident prone zones were identified and flagged through fluorescent hoardings. The police personnel were given First Responder medical training to cater to the victims.

Other successful examples of community policing in tribal belts have been tabulated as under:-

City/State	Program/ Scheme	Year	Short description
West Bengal (Kolkata)	Community Policing Initiative	1997	Citizens were involved in drug awareness programs; sports activities; 'nabadisha', a program for street children; 'Prabaha', a program for blood donation, Bravery and Honesty Award organized by the Detective Department; Counseling Centres; Claude Martin Fund for ex-prisoners; Police Assistance Booths.
Assam (Gawahati)	Nagarik Committees	2001	A comprehensive plan for meaningful participation of the public in policing in Guwahati City was drawn up and implemented in a successful manner.
Himachal Pradesh	Vishwas Yojna Suvidha Yojna Sanrakshan Yojna	2000	The program included visits of school children to police stations; production of educative, documentary films; village touring by district superintendent of police; police assistance centres; training in unarmed combat by police teams for girl students; police volunteers visit residences of elderly citizens living alone.
Tamil Nadu	Friends Of Police	1993	Citizens contribute to the prevention and detection of crime through beat and night patrols, assistance in traffic and law and order maintenance, crime prevention, information collection and involvement in prohibition work.
Maharashtra (Mumbai)	Mohalla Committee Movement Trust	1994	Committee members maintain cordial relations between Hindus and Muslims through meetings and liaison with the nearest police station.

Figure 12

Source: Janaagraha Centre for Citizenship & Democracy & Bengaluru Police. (2019). *Kerala's Janamaithiri Sanraksha Project*. Janaagraha. <https://www.janaagraha.org/files/publications/Handbook-on-Community-Policing-2019.pdf>

The most recent initiative of community policing in the left wing extremism tribal areas is in the state of Andhra Pradesh titled as *Project Varadhi* started on 16-11-2020 in the Chintapalli-Sub Division of Vishakhapatnam Rural District of Andhra Pradesh. The project tackles the problem of logistical bottlenecks in infrastructural projects by involving the tribal communities as well as elders for their timely completion in extremely remote tribal areas. The project not only caters to infrastructural development but also breaks the inimical barrier that has always shrouded citizen-police relationship. Such initiatives boost the morale of the people and reinstall faith in the law enforcement agencies' (BPR&D, 2022).

Thus, an analysis of the various models of community policing across the country, brings out certain coherent programmatic elements of community policing which Skolnick and Bayley (1988) have also enunciated. The same are as under:-

- Community and Police as coproducers of crime prevention
- Remodelling the traditional patrol model to cater to non-emergency services, as is the case of Beat Officers in India in various models of community policing.
- Accountability to the Public
- Transition to a decentralized command structure

Thus, community policing as a concept leads to increased grassroots support to the police from the public, uplifts the morale of the police, and instils an increased sense of satisfaction as well as confidence.

CONCLUSIONS & SUGGESTION

The manifestation of good intentions into robust programmes as outlined above, shows that community policing is a coherent programme with impressive benefits to the community as well as the police. It is an innovative model of *police professionalism* as touted by David Bayley, the doyen of community policing. Given the success of community policing programmes across the country, the same needs to be implemented as a uniform exercise throughout the nation. According to the 237th report of Standing Committee on Home Affairs, the Mooshahary Committee also emphasised on community policing to aid the police personnel in discharge of *non core and non policing* activities. The response of the States to the same is as under (DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE ON HOME AFFAIRS, 2022)

Fully Implemented	Partially implemented	Accepted but no action initiated	Under Consideration
Himachal Pradesh, Madhya Pradesh (Community Policing system implemented), Andaman & Nicobar Islands.	Tamil Nadu, Delhi, Chandigarh, Jammu & Kashmir	Nagaland, Uttarakhand, Sikkim, Manipur, Dada & Nagar Haveli, Punjab	Bihar, Meghalaya, Mizoram, Goa, Gujarat, Maharashtra

Figure 13

Source: DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE ON HOME AFFAIRS (2022). TWO HUNDRED THIRTY SEVENTH REPORT ON POLICE: TRAINING, MODERNISATION AND REFORMS In Session (No. 237). Rajya Sabha Secretariat, New Delhi.

Despite the success of community policing programmes in tribal regions as documented by the authors' above, the road towards effective implementation has not been smooth. The major challenges faced in the implementation as experienced at the ground level were :- (BPR&D, 2022).

- Tackling the fear entrenched in the minds of the tribal people due to prolonged radicalisation and indoctrination over a period of time.
- Psychological impediment and removal of tyrannical stigma associated with the police in the minds of the tribals.
- Fear of being branded as anti-Maoists or police informers.
- Logistical bottlenecks such as reluctance of contractors, NGO's who are the third party facilitators of such programmes to come to interior tribal belts.
- Targeted Maoist attacks on the people of such belts to deter their participation and cooperation with the police.

Thus, there is a dire need to address these bottlenecks.

Additionally, the major reason for the lack of uniformity across the country in the implementation of community policing is that police is a state subject under the seventh schedule of the Constitution. The prime responsibility falls on the states to make the programme a success. The same can be done on the lines of the state of Madhya Pradesh that has given statutory force to the model of community policing through the Madhya Pradesh Gram Thatha Nagar Raksha Samiti Act (Choudhary & Bureau of Police Research & Development, 2012). Thus, there is a dire need to give statutory force to the concept of community policing in India.

In the words of David Bayley, '*Community policing cuts across the grain of accepted police practice.*'

Finally, to conclude ,

"The police... must be viewed as friends of the people, of ordinary, honest citizens, even as they instill fear in lawbreakers. The basis of police authority cannot be mere law; it has to be trust of the community as well."

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COMMUNITY POLICING IN TRIBAL AREAS OF MAHARASHTRA - IMPLEMENTATION: CHALLENGES AND WAY FORWARD

Ashwinkumar Uday Bhoyar

ABSTRACT

Author has tried to investigate Community Policing efforts practiced in the State of Maharashtra with a focus on tribal areas from Retired Police officials who have served in these regions for at least two years. The researcher has analyzed the responses to the structured interview and identified the Challenges faced by the Police officials while implementing the Community policing programs in tribal areas.

Tribal areas have been divided into two categories, Normal areas and LWE areas so proper recommendations can be suggested which are suitable for the area by taking into consideration its individual problems / Threat perceptions. The researcher has also tried to identify whether there is a need for Institutional guidelines from the State Police Headquarters for basic information and procedures on how to conduct Community Policing programs in different settings. A new Community Policing initiative named, 'Dadalora Khidaki' by Gadchiroli District Police which is LWE prone is also identified and reviewed.

Finally, recommendations are given to improve the Community Policing practices in the Tribal areas of the State of Maharashtra.

INTRODUCTION

Community policing is a proactive strategy of Policing which is rising in its importance to address the problem of increasing Crime amongst the countries all over the World. As it was found that Traditional functions (Arresting Criminals, Investigation of Crime, Protection of property, Maintaining Law & Order, etc.) of Police organizations were not adequate to reduce crime in society, Community Policing was studied by various Criminologists & Sociologists as a supplementary tactic to be used by Police organizations along with traditional functions.

Community Policing works to improve Police - Public relations by using Formal and informal communication between them. According to Dr. Robert R., Friedmann, 'Community Policing is a strategy aimed at achieving more effective and efficient Crime control, reduced fear of crime, improved quality of life, improved Police services and Police Legitimacy through community resources that seek to change crime causing conditions. Thus, community policing increases the participation of the public in Policing functions through meaningful dialogue with Law enforcement agencies thus giving them an opportunity for working for their community's Welfare. In Democratic countries, such initiatives are responsible for increasing the trust in the Governments amongst the Citizenry.

COMMUNITY POLICING INITIATIVES IN MAHARASHTRA

1. Mohalla Samiti: formed at the Locallevel which helps the Police Department in maintaining Law and Order and reducing crime in its area. Police Officials from Police stations are mandated to Co-operate with these samities. People from all walks of life

can be part of these Mohalla samiti. Members of these samiti also give important information and intelligence to Beat Police officers about their areas which helps Senior Police Officials in their functions⁷⁰. Regular meetings of the Mohalla Samiti & Police officials take place throughout the year. Its minutes and results are given publicity through social media.

2. Mahatma Gandhi Tantamukt Gram Abhiyaan: Mahatma Gandhi Dispute Free Villages is an innovative scheme that was launched by the Home Department of the Government of Maharashtra on the occasion of Independence Day – 2007. This scheme envisages to resolve the petty and small disputes that occur in villages with the help of people's participation in meetings of Members of Tantamukt Gram Samiti⁷¹. Members of these samiti are elected by people themselves with few Official members. They have retired Soldiers, Police Patil & other reputed members as well. It creates a Democratic space that encourages people's participation in resolving issues faced by them. This scheme resolves the disputes which restricts the escalation of issues and thereby restricting crime. Samities also work to take preventive measures to ensure no dispute takes place.

TRIBAL / SCHEDULED AREAS

The criteria for declaring any area as a "Scheduled Area" under the Fifth Schedule of the Constitution of India are:

- The preponderance of the tribal population,
- The compactness and reasonable size of the area
- A viable administrative entity such as a district, block, taluka, and
- Economic backwardness of the area as compared to the neighbouring areas.

These criteria are not spelled out in the Constitution of India but have become well established. Accordingly, since the year 1950 to 2007 Constitutional Orders relating to Scheduled Areas were notified⁷².

Tribal Areas in Maharashtra: The State of Maharashtra has 50,757 Square kilometers area under Tribal sub plans against the Geographical area of 3,07,13 square kilometers. This works out to be about 16.5 percent of the geographical area of the state.⁷³ The total population of the state is 1123.74 lakhs as per the Census of 2011 out of which 105.10 are Tribal which is 9.35 percent of the total population.⁷⁴

⁷⁰ <https://www.mahapolice.gov.in/mohalla-committees/> (Official Website of Maharashtra State Police).

⁷¹ <https://www.mahapolice.gov.in/despute-free-village/> (Official Website of Maharashtra State Police.)

⁷² <https://tribal.nic.in/CIm.aspx> (Official Website of Ministry of Tribal Affairs, Government of India.)

⁷³ <https://tribal.maharashtra.gov.in/1012/About-the-Department> (Official website of Tribal Development Department, Government of Maharashtra.)

⁷⁴ Office of the Registrar General & Census Commissioner of India, Ministry of Home Affairs, Government of India.

REVIEW OF LITERATURE

There are multiple sources of Literature on Community Policing Books, Articles from various authors, Articles from the Indian Police Journal⁷⁵ & other professional Journals but despite the Researcher's serious efforts, no specific Literature regarding Community Policing in Tribal Areas was found to be available for reference.

RESEARCH METHODOLOGY

Area of Study: For effective research, this study is focused on Community Policing in Tribal Areas of Maharashtra State. There are 36 Districts in the state but the Tribal population is concentrated in the Eastern Forest districts of Chandrapur, Amravati, Yavatmal, Nagpur, Bhandara, Gondia & Gadchiroli which also face Left wing extremism / Naxal threats. Western hilly Forest districts consist of Palghar, Thane, Nandurbar, Dhule, Jalgaon & Nashik⁷⁶. 50 Talukas in these 13 districts are declared as Scheduled / Tribal areas.

Population of the Study: Retired Police officials from the Rank of Police Sub-Inspector to Superintendent of Police who have served in the Police stations of above 50 Talukas or Supervised the Police Administration thereof for a minimum 2 Years.

Method of Data Collection: As this is Exploratory research due unavailability of previous literature specific to the subject, the Researcher will use Structured interviews with the participants for Data collection.

Sample Size & Sampling Method: The sample size for this study is 50 retired Police officers. Serving Police officers are not included as they were reluctant to share the data / participate in interviews. Non-Probability Sampling Method namely Snowball sampling was used to reach out to willing participants.

Precautions taken for Error / Bias free Data Collection:

- (1) The questions to be asked in the Interview were translated into Marathi the Official language used in the state of Maharashtra for participants' ease of understanding.
- (2) Pilot interviews were conducted by the Researcher to see if any problems were faced or to remove any inconsistency. The researcher conducted the interview himself to avoid any Misunderstandings / Misinterpretations of the responses of participants.
- (3) The researcher has worked hard to eliminate any Researcher's Biases. The data collected is based on as it is conveyed by the participants without any intervention by the Researcher.

Ethics followed while conducting the Research by the Author:

⁷⁵ Indian Police Journal, Official publication of Bureau of Police Research and Development, Ministry of Home Affairs, Government of India.

⁷⁶ <https://tribal.maharashtra.gov.in/1062/Area--Population> (Official Website of Tribal Development, Government of Maharashtra).

- (1) All participants / Interviewees were briefed about how the information given by them would be used before the interview.
- (2) Interviewees were assured that their identification would be secret & their names were not recorded anywhere as per their requests.
- (3) It was conveyed to the participants that they can request to not to be included in the study if they have second thoughts even after giving the interview to the researcher.
- (4) The Researcher strongly believes in upholding the highest standards of ethics to be followed for conducting Research. All efforts have been taken in this regard.

DATA INTERPRETATION

Responses to the questions asked in the Structured interview are interpreted and the following data has emerged.

The total Participants is 50. / Maximum percentage is 100%.

- (1) Ranks of Respondents at the time of retirement were ASP to SP -12 (24%) / PSI to Police Inspector - 38 (76%).
- (2) Problems faced by Respondents in Policing in Tribal Areas were disclosed as follows;
 - A. Lack of sufficient manpower - 42 (84%)
 - B. Shortage of Funds for expenditure - 47 (94%)
 - C. Language interpretation - 33 (66%) D. Shortage of Vehicles - 36 (72%)
 - E. Longer distances / Inaccessible areas -- 28 (56%)
 - F. No Cellular and Lack of Wireless network - 35 (70%)
- (3) Awareness of Community Policing amongst the participants was observed to be Yes=45 (90%) No = 5 (10%).
- (4) Out of 45 respondents who knew about Community Policing 5 came to know about it from Conferences; 13 from reading about it & 27 from their Senior officials.

STATUS OF IMPLEMENTATION OF COMMUNITY POLICING IN TRIBAL AREAS OF MAHARASHTRA

- (5) Out of a total of 50 respondents; 14 (28%) did not see any Community Policing initiative in tribal areas they were posted at & 36 respondents (72%) have seen Community Policing initiatives practiced in Tribal areas where they were posted. Amongst the 36; 29 (58%) have participated actively in such initiatives. The remaining 7 (14%) were skeptical about such an initiative and thus did not participate in it.
- (6) Participation of the community from tribal areas for which the Community Policing initiative was implemented was seen as High= 0 (0%), Moderate=3 (6%), Less=34 (68%) & No participation=13 (23%).
- (7) Challenges faced/seen while implementing Community Policing initiatives in Tribal areas were identified as

A. Lack of education/awareness in people in Tribal areas about Law / Police= 40 (80%).

B. No awareness of Community Policing's usefulness amongst the public in Tribal areas 32 (64%).

C. Shortfall of resources at the Police station levels in Tribal areas 47 (94%).

D. Absence of cellular network in far areas of their Jurisdiction= 35 (70%).

E. Reluctance of people to Cooperate with Police due to lack of incentives 31 (62%).

F. Problems in understanding of Language spoken by people in Tribal areas= 33 (66%).

(8) 31 participants (62%) think that consistency of Community Policing initiatives cannot be maintained in the long run. 12 participants (24%) think that consistency can be maintained in the long run. 7 participants (14%) think that they cannot say how long consistency can be maintained for such initiatives.

(9) All 50 participants (100%) agree that there is a need for specialized training to be imparted to all Police officers and their subordinates regarding Community Policing in Tribal Areas. They also want the State Police Headquarters to come up with a Standard Operating Procedure or SOP regarding the same.

(10) All 50 participants (100%) also agree to the fact that There is a need for a separate budget to be allotted to all Police stations specially for Community Policing.

CONCLUSION

Thus, certain conclusions can be drawn after the data interpretation of the collected data by the researcher which are as follows: -

(1) 90% of the respondents were aware of Community Policing but from different sources which is responsible for lack of clear collective understanding.

(2) Police officers are facing similar issues in Policing the tribal areas & implementing Community Policing initiatives in tribal areas. For example, Shortfall of resources, Local languages spoken, etc.

(3) There seems to be a lack of a unified approach in undertaking or implementation of Community Policing initiatives. Consistent efforts seem to be missing as well.

(4) There is a need for the Police Headquarters to issue a Standard Operating Procedure and conduct Training courses for Police officers to resolve the issues faced thereof by Field officers.

(5) Community for which the Community Policing initiatives are implemented also must be educated about it to mitigate the problems of willingness to co operate with Police officers by them.

RECOMMENDATIONS FOR IMPROVEMENT IN FUTURE

A) Gadchiroli & Gondia districts

Gadchiroli and Gondia district are prone to Left-wing extremism / Naxal threats. Thus, separate recommendations needed to be given for these by taking into consideration the threatperception of the Tribal districts where there is a threat of Left-wing extremism it is most difficult to secure the cooperation of the public as people fear the repercussions from the Naxalites. Maharashtra Police is taking proactive steps in tackling these threats to national security by offensive action against the Naxal movement only this cannot suffice to quell the reluctance amongst the tribals to co-operate with the Police department. Police needed a softer and Community-oriented program to work for the tribal community which will improve the Police-public interface. Thus, a new initiative was started from Bhamragad taluka which was much appreciated and expanded.

Gadchiroli District police run a program called, 'DADALORA KHIDAKI.' Dadalora Khidaki - One Window, All Solutions is a Community Policing initiative that is working to provide services to the Tribal population of the district. Multiple services like providing Aadhar cards, Caste certificates, employment schemes, and training, providing seeds for agriculture, and benefits of different government schemes to the Tribal population are being facilitated through this single window. There are 53 such windows in Gadchiroli District where one Civic action team is present⁷⁷.

Awards are being given to the Police officers who are doing a good job in this area. They are being recognized as Community Development Officers of the Month. Cash prizes and certificates are being granted to them for their good work. This is working on improving the morale of the Police officers who are working in such strenuous conditions in Left-wing extremist areas.

Thus, the Dadalora Khidaki initiative is working to improve the trust between the residents of tribal areas and the Police department. These services being provided to Tribal residents are responsible for reducing the fear and mistrust of Police which was prevalent for years. This is a model that can be replicated throughout the country where Tribal districts with LWE threats are present for similar results. This initiative will hit the Naxal movement hard as it will reduce their recruitment from the tribal population as they can now trust Police and Government.

B) Other Districts with Tribal / Scheduled areas without LWE threats

- (1) There is a need to recruit more people who know the language spoken by people in Tribal areas so that communication is facilitated or necessary training must be provided to Police officers before being posted to these 50 talukas declared to be Tribal areas.
- (2) Adequate resources must be provided to the Police stations like Fuel, Monetary resources, Vehicles in adequate numbers etc. so that they can be used by staff for important work.
- (3) A scheme like Dadalora Khidaki can work for the tribal residents in these areas as well.

⁷⁷ <https://www.gadchirolipolice.gov.in> (Official website of Gadchiroli District Police)

- (4) Separate Staff and monetary resources are needed in every Police station for Community Policing preferably An Assistant Sub Inspector and two constables who will be working solely for this purpose and who can speak/understand the language spoken by people in tribal areas.
- (5) Training courses must be developed by the State Police training academies on Community Policing so Police officers can learn about its effectiveness.
- (6) Steps must be taken to improve the Consistency of Community Policing initiatives. A lack of response from the public, should not make the initiative wither away.
- (7) Improvement of public awareness is also necessary to increase public participation in tribal areas in Community Policing initiatives, and meetings.
- (8) Institutional guidelines / SOP is the need of the hour for effective implementation of Community Policing initiatives. These need to come from the State Police Headquarters which will give the basic structure of the initiative. Flexibility will be needed so that Field officers can implement the program as per the requirements of their units.

About the Author

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TRADITIONAL SOCIAL CONTROL IN MIZO SOCIETY: HISTORICAL PERSPECTIVES AND CONTEMPORARY RELEVANCE IN COMMUNITY POLICING

RL. Rohlupuii

ABSTRACT

This paper explores the traditional social control mechanisms within Mizo society, focusing on their historical evolution and contemporary significance in community policing. It examines the roles of traditional institutions such as *Lal* (Village Chiefs), the *Zawlbuk* (bachelor's dormitory), and *Tlangval* (male youths) in maintaining social order and their integration into modern policing frameworks. The study highlights how these traditional practices have influenced and enriched contemporary community policing strategies in Mizoram. By bridging historical practices with modern law enforcement approaches, the paper demonstrates how traditional values continue to play a vital role in fostering community safety and cohesion.

INTRODUCTION

Community policing is a concept wherein law enforcement agencies collaborate with community members to improve public safety and address local concerns. Although contemporary community policing emphasizes new strategies and techniques, many societies have historically practiced similar forms of communal justice. This paper investigates traditional community policing in Mizo society, exploring its historical background, the role of traditional institutions, and its applicability in contemporary settings.

In the course of human history, societies have continually worked to safeguard their members and uphold order and cohesion - by monitoring the conduct and behaviors of their members according to the prescribed traditional set of codes of conduct. The forces and agents of social control may differ and specific to different societies at different times. In *Police and Policing: An Introduction*, Richard J. Lundman traces and outlines the evolution and progression of policing and social control through three distinct stages. The first stage is defined by informal forms of control, where every member of society shared responsibility for maintaining order and fostering social harmony. The second stage emerged when specific individuals were informally entrusted with duties of oversight and regulation within the community. This phase served as a step to the third stage, where particular members of society assume formal,

recognized roles in safeguarding the community and ensuring the stability and cohesion of social life.⁷⁸

In the early stages of social and political development, society tends to rely on policing each inhabitant under the constant observation of his neighbours and the village elders.⁷⁹ In many societies, as in Mizo society, this principle of communal responsibility was fundamental. In Mizo society, traditional social control mechanisms have evolved through various historical phases, integrating into modern community policing, thereby, reflecting the unique social structure and cultural values of the Mizo people.

METHODOLOGY

The methodology for this research paper involves a qualitative approach combining archival research, newspaper analysis, document review, and in-depth interviews. Archival research examines historical records to understand traditional Mizo social control mechanisms, while newspaper analysis provides insights into contemporary and historical media representations of these practices. Document review, including both public and private sources, offers additional context on community interactions and the adaptation of traditional methods. In-depth interviews with local historians, elders, traditional leaders, and community members are conducted to gather detailed qualitative data on the integration of traditional practices with modern community policing strategies.

MECHANISMS OF TRADITIONAL SOCIAL CONTROL

THE CHIEF AND CHIEF'S COUNCIL

In pre-colonial Mizoram, the traditional practice of policing was informally exercised by particular members of the society. Before the advent of the British, the Village Chiefs, along with their advisers-known as the *Upa* (Village Elders) - exercised absolute authority in maintaining law and order. In matters of justice, the Chief would consult with the Council of Elders to determine appropriate disciplinary actions or punishments for various offenses.⁸⁰

The Mizo society was a chief-centered society. Each village was independent and the chief was a supreme leader in his own village. He was entrusted with a variety of functions including administration, judicial, allotment of *ijhum* plots to the villagers,

⁷⁸ Richard J. Lundman, *Police and Policing: An Introduction* (New York: Holt McDougal, 1980), 120-121.

⁷⁹ Percival Griffiths, *To Guard my People: The History of the Indian Police* (London: Allied Publishers Private Limited, 1971), 7.

⁸⁰ David Zothansanga, "Police Administration in Mizoram: 1987-2005" (PhD theses, Mizoram University, 2012), 128.

maintenance of *Zawlbuk* (bachelor's dormitory), approval of religious and festival affairs, settlement of war and diplomatic matters. The Chief, in consultation with the *Upas*, made decisions on all civil and criminal matters within his jurisdiction. The villagers were obligated to follow his judgments, regardless of the type of punishment. For serious offenses, the Chief had the authority to decree capital punishment. Fines were imposed on those who committed offenses, with the proceeds used to compensate the affected party. The Chief could take over the property and assets of any of his villagers who did not abide by the rules and customary practices and those who planned to migrate to any other village owing to any reason including disagreement with the chief.⁸¹ The Chief's decisions were absolute. If a man killed another villager and, fearing retribution, sought refuge at the Chief's house, the Chief would offer protection. Once granted sanctuary, no one would dare to seek revenge against the killer, who would then remain a *Bawi* (servant) of the Chief for life.⁸²

ZAWLBUK (BACHELOR'S DORMITORY) AND TLANGVAL (MALE YOUTHS)

Apart from the Chief and his Chief's Council, all the male youths of age in each village were responsible for policing the society. Maintenance of peace, welfare and security of the society rested in their hands. Their main reason for sleeping at *Zawlbuk* was for the purpose of defending the society. *Zawlbuk* served as *Ralven Buk/bahrik* (duty post), from where they safeguarded and defended the village, thereby providing peace and harmony to the people. In times of tribal warfare and conflicts, *Pasaltha* and male youths guarded and assisted crofters to and from the agricultural fields.

Besides serving as a place for providing security to the society, *Zawlbuk* in pre-colonial Mizo society was an important site for monitoring the conduct of the members of the society and functioned as the most potent institutionalised mechanism of social control.⁸³ The *Zawlbuk* operated under a strict system of discipline, with a leader known as *Val Upa* - acknowledged by the Chief to oversee its enforcement. *Val Upa*, chosen for his bravery, resourcefulness, hunting skills, and industrious nature, was responsible for ensuring proper behavior among the residents - *Tlangval* (group of male youths/lads). *Tlangval* were expected to follow his authority without question. While the Chief held the official title of head of the *Zawlbuk*, his role was largely ceremonial. The real power and administration were in the hands of *Val Upa* and *Tlangval*. In some cases, the Chief would even turn a blind eye to actions or harsh punishments carried out by the *Tlangval* under *Val Upa*'s command. The Chief himself refrained from scolding or intervening in *Zawlbuk* affairs. If disturbances arose, such

⁸¹ Nancy Lalrinmawii Rokhum, "Social Stratification of the Mizos," *Mizo Narratives: Accounts from Mizoram*, Malsawmdawngliana and Rohmingmawii (eds.), R.K. Pillai for Scientific Book Centre, Assam, 2014, 31.

⁸² Rokhum, *Social Stratification of the Mizos*, 38.

⁸³ N. Chatterji, *The Earlier Mizo Society*, Tribal Research Institute, Aizawl, 1975, 61.

as noise during nighttime activities, the Chief would delegate one of his elders to inform *Val Upa*, who would then address the issue.⁸⁴

Under the authority of *Val Upa* and the *Tlangval*, the *Zawlbuk* functioned as a center for maintaining discipline and administering punishments. The Chief refrained from intervening in certain types of punishment, particularly those enforced by *Val Upa* and the *Tlangval* for breaches of community rules, norms, and values. These punishments were carried out without the Chief's direct involvement, especially in cases that involved strict enforcement. *Zawlbuk* functioned as an institutionalized mechanism for carrying out discipline or punishments to those who did not abide by the rules, norms and values pertaining to the society.⁸⁵ Such cases of punishments were often harsh and humiliating for the receivers.

Tlangchil was a form of punishment or discipline imposed on a *Nula* (maiden) or her family if they mistreated or showed hostility toward a *Tlangval* (young man) who came to court her. If a rejected *Tlangval* reported the incident to the *Zawlbuk*, *Val Upa* and the other *tlangval* would, after careful discussion, retaliate by vandalizing the maiden's home. This act of vandalism was a deeply humiliating form of punishment. To avoid such disgrace, Mizo maidens in pre-colonial society were highly cautious not to offend any *Tlangval*.

Beyond the physical act of punishment, the social stigma attached to it was often more unbearable for the *Nula* and her parents. The fear of social repercussions strongly shaped their actions, influencing their interactions with suitors and others. To prevent ostracism by both the *Tlangval* and the broader community, their decisions were largely driven by concerns over reputation, acceptance, and social standing.

Tlängsawi was another type of punishment where a person who was believed to have caused nuisance to the community would be manhandled by the *Tlangval*, without revealing their identity to the person. *Zawn* was another type of disciplining a *Nula* (maiden) who was known to have loose behaviour and indulged in licentious activities. The village *Tlangval* would abducted her and took her to some secluded or isolated areas, where they would took turns in assaulting her.

Though such methods of disciplining were brutal, the chiefs would turned a deaf ear, since the act was being carried out by the 'defenders of the society.' As Sangkima observes, "*Zawlbuk* was a powerful institution which exercised the greatest sway in establishing social norms and custom among the Mizo people"⁸⁶.

In pre-colonial Mizo society, social control was maintained through a mix of formal and informal mechanisms that regulated behavior and upheld societal values. Community-based systems of discipline and social practices enforced conformity,

⁸⁴ James Dokhuma, *Hmanlai Mizo Kalphung*, Mizoram Publication Board, Aizawl, 2008, 139.

⁸⁵ Esther Laltlankimi, "Morality of the Mizo: Then and Now," *Historical Journal Mizoram*, Vol.XX, October 2019, Aizawl, 139.

⁸⁶ Sangkima, *Mizo: Society and Social Change*, Spectrum Publications, Delhi, 1992, 39.

while the fear of punishment and social repercussions encouraged adherence to norms. These systems ensured order, unity, and respect within the society.

PASALTHA (WARRIOR)

Besides the *Val Upa* (Youth Commander), who was customary for every inmate to obey him,⁸⁷ *Pasaltha* (warrior) was another important person in the Mizo society by dint of their talent and ability in terms of warfare and hunting. It was him who led the youths in times of warfare and conflicts with neighbouring tribes. *Pasaltha* was held in high regards by the youths, thereby, Mizo males' perceptions and views on masculinity, the criteria and roles they had to meet and performed in order to be considered as an 'ideal man' were, to a great extent, influenced and laid down by the *Pasaltha*, both by words and actions.

COMMUNITY INVOLVEMENT

Community involvement was a fundamental aspect of traditional Mizo social control. Villagers actively participated in maintaining order and resolving conflicts. Elders and respected figures acted as mediators, ensuring that justice was administered in accordance with communal values. All the members of the society actively supported the decisions of the custodians of power. This collective approach fostered a strong sense of responsibility and accountability among community members.

CONTEMPORARY RELEVANCE

A modern system of law enforcement was introduced to the Mizos after the British Government took over the Lushai Hills in the year 1890. However, the functions of police in the interior were still carried out by the chiefs and circle staffs except in very special and rare occasions.⁸⁸ The first Police Station was established in Aizawl in 1895. The Civilian Police was started in 1899. Between 1947-1972, while Mizoram was under Assam as a Mizo District, six Police Stations were sanctioned at Aizawl, Lunglei, Saiha, Kolasib, Champhai and Tlabung in the year 1947. The post of the First Superintendent was created in 1960. Furthermore, a small Crime Investigation Department (CID) Cell was started under the supervision of Deputy Superintendent.⁸⁹ After Independence, a police administration was established which suffered a setback during the insurgency period of 1966-86. When Mizoram became a union territory in 1972, an independent Mizoram Police was born. In 1973, the 1st Battalion Mizoram Armed Police was established. When Mizoram became a full fledged state in 1987, the police administration was restructured and strengthened as a key mechanism of social

⁸⁷Nancy Lalrinmawii Rokhum, "Social Stratification of the Mizos," in *Mizo Narratives: Accounts from Mizoram*, eds. Malsawmdawngliana and Rohmingmawii, p.40.

⁸⁸A.G.McCall, *The Lushai Hills District Cover*, The Tribal Research Institute of Mizoram, Aizawl, 1980, 48.

⁸⁹F.Vanlalrochana, "For Duty, Honour, People," *Mizoram Police 50th Anniversary Souvenir*, Aizawl, 2021, p. 151.

control, aimed at improving law enforcement, ensuring public safety, and addressing the state's evolving challenges and needs.⁹⁰

Apart from the Police administration, various sites and agencies like NGOs, student bodies, and social organisations like Village Defence Party (VDP), Young Mizo Association (YMA), MHIP, Mizo Zirlai Pawl (MZP), etc., in Mizoram that provide functional medium for community policing in the Mizo society. Among these, the YMA is a prominent organization that plays a significant role in community policing within Mizoram by actively engaging in various activities that support and complement law enforcement efforts. It organizes community outreach programs and awareness campaigns on issues like crime prevention, substance abuse, and safety measures, it collaborates with police authorities to support their initiatives. This includes assisting in local crime prevention efforts, participating in neighbourhood watch programs, and supporting police operations during community events.

There is an interaction between these modern agencies and the traditional policing practices of the Mizo society. These agencies and organizations advocate for collaboration between police and community members, reflecting the traditional emphasis on collective responsibility and engagement. By involving local residents in maintaining order and addressing issues, modern policing benefits from the communal approach of traditional practices.

CONCLUSION

Traditional social control mechanisms in Mizo society offer valuable insights into the evolution of policing practices and their relevance today. Historical practices of chieftainship, customary laws, and community involvement provide a foundation for understanding how traditional and modern approaches to social control can coexist and complement each other. Integrating traditional values with contemporary strategies can enhance the effectiveness of law enforcement and foster stronger community relations. The continued relevance of traditional practices highlights their potential to contribute positively to modern community policing efforts.

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