

Indelible Ink in Elections

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Executive Summary

The one-person, one-vote adage has long been a rally call for an inclusive, genuine and legitimate process to determine who should represent the people in government. However, what happens when an electoral process is vulnerable to fraud by individuals who want to cheat the system by voting multiple times to improve the chances of a favorable outcome for their preferred candidate?

Multiple voting, when one or many individuals seek to exploit weaknesses in the electoral process with the aim of manipulating the result, is one such vulnerability. One way in which election management bodies (EMBs) protect against multiple voting is by marking voters' fingers with indelible ink during the voting process. There are advantages and disadvantages to the adoption of indelible ink, and EMBs who are considering integrating it into the electoral process should do it carefully with regard to their respective country contexts. In addition, while the use of indelible ink can assist in the prevention of voter fraud, it is not a panacea. Looking at case studies around the world, this paper offers a discussion guide for EMBs considering implementing, improving, or abandoning finger inking processes.

With sound understanding of available choices of ink solutions and sufficient training on implementation, indelible ink can be of great value to the electoral process. However, ineffective ink or inconsistent application can easily discredit the electoral process. As with many other electoral tools, the value of ink application is highly dependent upon the quality of the ink and its correct use, as well as stakeholders' correct understanding of its added value. This paper provides an analysis and evaluation of past and present experiences with the use of indelible ink, including a presentation of invisible and visible types, delivery mechanisms – bottle, brush, marker and spray – composition of the ink, and how to test and dispose of it.

Indelible ink is not reliable if testing, storage policies, and usage procedures are not followed meticulously. In some cases, ink effectiveness has been compromised by people using household chemicals to remove it, even if they risk harming themselves by doing so. Quality assurance problems from manufacturers may pose another set of problems. The application of ink can also be challenging due to cultural, religious, health, or security concerns. These issues, in addition to product quality issues and improper application, have made indelible ink a controversial and widely debated topic. Most countries that use indelible ink tend to establish provisions for its use in their electoral laws, while some rely purely on procedural norms established by their EMBs.

Only in exceptional cases should indelible ink be used as a singular tool to prevent multiple voting. Those are cases when it is impossible to compile a proper voter list due to time constraints or the absence of reliable personal identity documents. In regular cases, it can be an effective additional safeguard and preferably should only be used together with other complementary security measures. Ink can also serve as a ceremonial symbol of Election Day that provides a visual "I voted" signal to others. Countries should consider whether there are safety concerns with this visual cue before opting for the use of ink and deciding on visible or invisible ink. If invisible ink is used, special ultraviolet (UV) LED lights must be used to check the marks.

This paper outlines how indelible ink is treated in electoral legislation, the role of EMBs in determining ink usage, as well as procedural, practical and technical issues. Based on international experiences using indelible ink, the paper outlines a list of considerations for those contemplating the use and optimization of indelible ink, including procurement, composition, delivery mechanism, training, testing and disposal, as well as effectiveness as a tool to strengthen electoral integrity. As such, this paper can serve as a guideline for EMBs as they consider appropriate indelible ink solutions within the context of their respective countries.

Given the challenges around using indelible ink, any decision to introduce ink to the electoral process should be taken following consultation with all relevant stakeholders, and with enough lead time for legal framework harmonization (if needed), procedures development, appropriate pilot testing, competitive procurement process, a detailed cascade training for polling staff, and voter information campaigns. Consideration of the specific circumstances of a country and its culture is always essential.

Considerations in the adoption and use of indelible ink in elections are summarized as follows:

- Although dipping bottles require more ink, they are often the preferred option as they instantly create a visible mark and electoral officials are more likely to apply the ink properly;
- The indelible ink mark must last longer than the period of voting. This is particularly important if voting lasts more than one day;
- The ink must be safe for the health of voters and polling staff, with no more than 25 percent silver nitrate;
- Sufficient quantities of indelible ink must be in supply;
- Indelible ink must be procured to arrive well in advance of elections to allow for distribution, testing, training and public outreach campaigns. The ink's shelf-life must be considered;
- If ink is only visible under UV light out of concerns of electoral violence or individual integrity, functional UV lamps and spare batteries should be supplied to each polling station. Additional costs should be considered to accommodate this form of inking;
- Manufacturers should supply ink to an EMB in leak-proof, security-sealed containers made of high-quality materials to avoid distortion of the silver nitrate level. Both packaging and bottles need to be properly labeled in the local language(s);
- Training of polling officials is crucial and should be thoroughly implemented;
- Consider a public check and a media event around testing of the ink quality and ink application procedures;
- Ink should be thoroughly pre-tested to ensure correct composition and usage and that it cannot be removed from the finger for the required time period;
- The EMB should ensure the public is well-prepared to accept indelible ink as a method to prevent multiple voting, especially in societies with significant cultural resistance toward using ink, by delivering messages and fostering debates with participation of observers and political parties about the usage of indelible ink so the mechanism is accepted on Election Day as part of election integrity; and
- Finger inking should be adopted as only one aspect of an anti-fraud strategy.

Introduction

Credible and representative elections with widely accepted results signify an integral part of democratic development. Since the mid-20th century, elections have come to be widely seen as the best way of forming good governments: a nonnegotiable feature of political life. And yet, like all systems, all elections are susceptible to fraud and manipulation.

While electoral integrity challenges take many shapes and forms, one of the most basic challenges is to safeguard the principle of one person, one vote. Often understood in terms of enfranchisement, it also refers to limiting the opportunity to vote to avoid multiple or plural voting, when a citizen attempts to vote more than once in an election in an attempt to defraud the system and improve the odds of a favorable outcome for their candidate of choice.

This analysis of the use of indelible ink in the electoral process (see Annex 1 and 2 for summary of key data points by country) fills a gap in the existing literature (see Annex 3 for a list of key resources) by assessing the benefits and challenges involved in the use of indelible ink, as well as how indelible ink may contribute to safeguarding electoral integrity. It is intended as a resource for election administrators, legislators and other electoral stakeholders, including political parties and national observer groups, as an aid in their response or assessment of these challenges.

This paper outlines how indelible ink is treated in electoral legislation, the role of EMBs in determining ink usage, as well as procedural, practical and technical issues. The paper also aims to clarify the effect the use of indelible ink has on the electoral process. The paper can serve as a guideline for EMBs and other electoral stakeholders as they explore appropriate indelible ink solutions within the context of their respective countries.



Sri Lankan voters proudly display their inked fingers following the January 2015 presidential election to demonstrate their participation in the democratic process.

Context

Indelible ink has become a commonly used tool to boost confidence in elections by addressing vulnerabilities that enable multiple voting. Ink is often used to boost confidence in emerging democracies and post-conflict elections. However, it is also sometimes used in countries that have long-standing electoral administrations and processes, such as Algeria, Indonesia, Paraguay and South Africa, to provide an additional anti-fraud measure. Even countries that rely significantly on the use of technology in elections, such as India, Mexico, and the Philippines, utilize indelible ink. This is important to note as a perception can exist that a functional electoral process does not use ink, as was the case in Bosnia and Herzegovina where the use of ink was discontinued after other system improvements.

Once marked, a voter can no longer vote even if his or her name appears on the voter list of another polling station. In exceptional cases, ink is also used to prevent multiple registrations of voters.¹ In a best-case scenario, the use of ink promotes the electoral rights of citizens and operationalizes other key principles such as transparency.

However, ineffective ink or its improper or inconsistent application may jeopardize the integrity of the electoral process and discredit an election. The application of indelible ink can also be seen as controversial in some contexts and its introduction may be met with resistance from electoral stakeholders for cultural, religious, political, health, and security concerns.

When a country is considering using ink, the EMB must ensure that voters, national observer groups, political parties and other electoral stakeholders are consulted and properly informed through a comprehensive awareness-raising campaign. Stakeholder engagement is also important at three other points in the process: voter education (how the ink will be used), testing and post-election lessons learned events.

As mentioned, indelible ink is only one tool to prevent multiple voting and election fraud and should be part of a comprehensive fraud prevention strategy. Ideally, finger inking should be used along with other efforts and safeguards, including accurate voter lists; high quality documents for voter identification; well-designed polling stations; well-trained poll workers; sealed, transparent ballot boxes; and an effective chain of custody for tracking the distribution and retrieval of ballots. Further measures to enhance the integrity of the electoral process include observation by party agents, national and international observers and the media.

¹ Ink was used to mark voters during the registration of voters for South Sudan's referendum for independence.

Legislation

Multiple voting is addressed in various international conventions and national legislative frameworks. Some countries stipulate that indelible ink should be employed and provide details about its usage.

Multiple voting dilutes the weight of legitimate votes, undermining the principle of Article 25 of the International Covenant on Civil and Political Rights (ICCPR)²: “Every citizen shall have the right and the opportunity, without any of the distinctions mentioned in article 2 and without unreasonable restrictions: (a) To take part in the conduct of public affairs, directly or through freely chosen representatives; (b) To vote and to be elected at genuine periodic elections which shall be by universal and *equal suffrage* and shall be held by secret ballot, guaranteeing the free expression of the will of the electors; (c) To have access, *on general terms of equality*, to public service in his country [emphasis added]”³; and “one person, one vote” from article 21 of the General Comment 25⁴ to ICCPR.

The Council of Europe’s Venice Commission Code of Good Practice in Electoral Matters⁵ reinforces the practice in Section 2.1, Paragraph 11, which says “Equality in voting rights requires each voter to be normally entitled to one vote, and to one vote only. Multiple voting, which is still a common irregularity in the new democracies, is obviously prohibited – both if it means a voter votes more than once in the same place and if it enables a voter to vote simultaneously in several different places, such as his or her place of current residence and place of former residence.”

The Venice Commission, in its *Summary Report on Voters Residing De Facto Abroad*⁶, mentions indelible ink as a good complement to identity controls: “Another efficient measure against double vote is the use of indelible ink: Its application on the same finger, as well as controls at the polling station, have of course to be systematic.” Other documents referencing international standards do not specifically define indelible ink as a mechanism aimed at preventing multiple voting.

Statistically, almost a third of all countries that conduct democratic elections stipulate the use of indelible ink in their legislation. Other countries include the use of ink in their voting procedures, but not in their electoral legislation as shown in the map below. As a rule, norms defining the usage of ink in electoral legislation are quite general.

Legal provisions in countries that do legislate the use of indelible ink vary in terms of which finger the ink should be applied to and at what stage of the voting process the inking procedure should be conducted. Ethiopian legislation, for example, requires a voter to sign the electoral roll and then present his or her

² Available at <https://www.refworld.org/docid/3ae6b3aa0.html>

³ UN General Assembly, International Covenant on Civil and Political Rights, December 16, 1966, UN, Treaty Series, volume 999, page 171. Available at: <http://www.refworld.org/docid/3ae6b3aa0.html>

⁴ CCPR General Comment No. 25: Article 25 (Participation in Public Affairs and the Right to Vote), The Right to Participate in Public Affairs, Voting Rights and the Right of Equal Access to Public Service. Available at: <https://www.refworld.org/docid/453883fc22.html>

⁵ Venice Commission, *Code of Good Practice in Electoral Matters Guidelines and Explanatory Report*, October 18-19, 2002. Available at: [http://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-AD\(2002\)023rev-e](http://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-AD(2002)023rev-e)

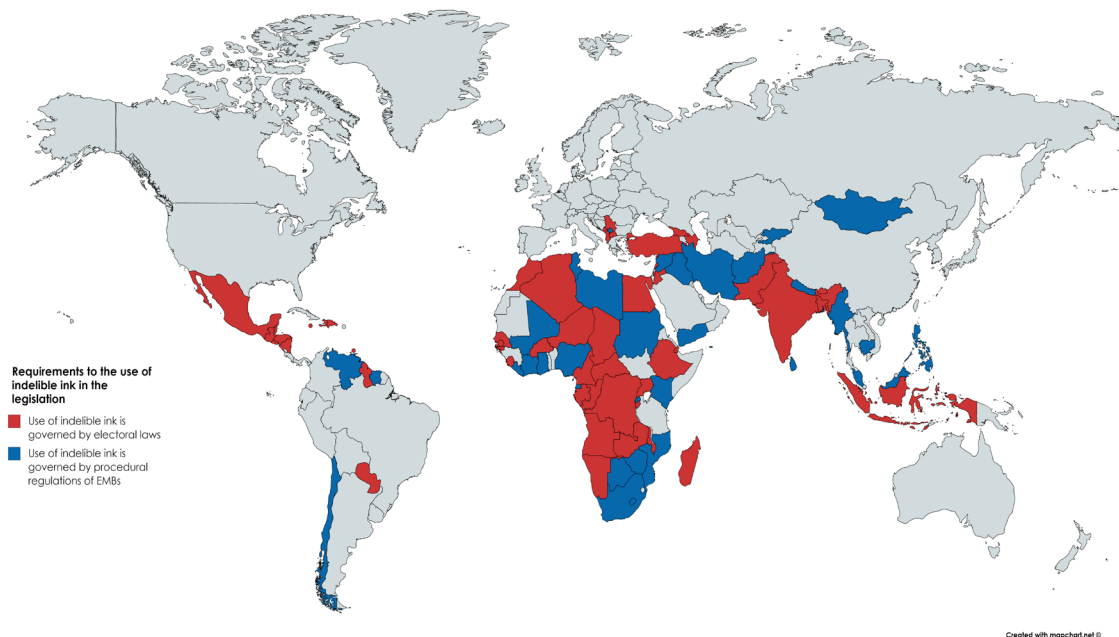
⁶ Venice Commission, *Summary Report on Voters Residing De Facto Abroad*, December 17, 2017. Available at: [http://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-AD\(2015\)040-e](http://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-AD(2015)040-e)

thumb for inking. After the finger has been inked, the voter is handed a ballot paper and directed to the voting booth. By contrast, in Trinidad and Tobago, the law requires that the voter immerse his or her index finger in the indelible ink pot after receiving the ballot paper. In Angola, the voter dips his or her right index finger in the appropriate ink after casting the vote in the ballot box, and then leaves the polling station.

In most countries that legislate the use of ink, it is a common practice for the law to state that ballots will not be issued to voters who refuse to be marked with indelible ink or if they already have been inked or display traces of ink. However, generally, if a voter has any physical disability that makes the application of indelible ink impossible – i.e., no fingers or hands – legislation stipulates that such a procedure should not be conducted.

The provisions regarding the use of indelible ink may sometimes be applied in proxy voting. For example, Antiguan legislation states that no ballot papers will be delivered to a person voting on behalf of another voter, unless the finger of the proxy voter is marked with red indelible ink. The case of Antigua and Barbuda is also interesting because the color of the ink applied to the proxies differs from the one that is used for voters whose fingers are immersed in black indelible ink.

In some cases, the specific characteristics of the ink are written in the law as well. For instance, in Azerbaijan, the voter’s thumb must be inked using a “harmless, invisible liquid by spraying.” However, such detailed legal provisions are quite rare. At the same time, there are countries where the EMBs, rather than the law, regulate the use of indelible ink. For instance, to address the issue of multiple voting, the Union Election Commission of Myanmar from 2014 onward issued polling instructions significantly amending the voting procedures in which the use of indelible ink was formally introduced.



Requirements to the use of indelible ink in the legislation: data collected by IFES as of December 2017

Procurement

The EMB, responsible for the administration of the election, plays a primary role in ensuring ink is procured and used appropriately. As with procurement of other electoral materials, ensuring a transparent and effective indelible ink procurement process is strongly linked to overall electoral integrity. This document does not aim to detail complex procurement procedures, but rather to highlight the most important elements of any sizable indelible ink procurement. A detailed procurement plan with reference to policies, procedures, operational timelines and sustainability is critical. EMB procurement officers must know exactly what is needed – technical specifications (type, composition, packing) and quantity required – as well as planning for contingencies and testing, transportation, storage, disposal requirements and timelines.

Some factors to consider in procurement include: once dry, the ink should not be hazardous to health, especially to the eye or skin; ink markings must be clearly visible on all skin types and colors and the cuticle, turning into black, brown, or violet color when dry; depending on the length of the election period, the ink must remain indelible for a minimum period after application; and the ink should be adequate for use in both dry and humid weather conditions.

Given the complex and necessary packaging, transportation and storage of indelible ink (see Section VII below), it is essential to develop a solid set of procurement specifications with all technical details from the outset of the process. To ensure indelible ink is procured in sufficient quantity, the procuring entity must estimate, through proper testing, how much ink could be used on Election Day to serve the estimated number of voters and polling stations.

Decisions on the procurement of indelible ink should be made in close coordination with senior EMB operations staff. Allowing sufficient time for competition is important to enable suppliers to research, analyze and understand all requirements and develop responsive offers that establish and demonstrate good value. Some EMBs recruit professional assistance providers to conduct analysis of requirements and draft technical specifications to ensure accuracy. Ensuring vendors comply with commitments and conduct regular follow-up activities are important both for environmental and financial audit concerns. Useful indelible ink procurement guidelines for EMBs can be found in publications on procurement of electoral materials from IFES⁷ and the United Nations Development Programme (UNDP).⁸

⁷ Please see examples of Request for Quotation from IFES at http://ifes.ifesbuyersguide.org/procurement_pdf/1299525787.pdf

⁸ UNDP Programme and Operations Policy and Procedures related to procurement available at <https://popp.undp.org/SitePages/POPPBSUnit.aspx?TermID=254a9f96-b883-476a-8ef8-e81f93a2b38d&Menu=BusinessUnit>

Polling Station Procedures, Application and Verification

Indelible ink can serve as a reasonably effective measure against multiple voting. However, it is not reliable if not well-applied, potentially discrediting the electoral process, as noted in observer reports (Annex 2). It is thus crucially important that EMBs include training as a non-negotiable part of the process.

The way the ink is applied, be it by pen, bottle, spray or brush, as well as the actual ink content and the training of poll workers on the correct application and verification are of immense importance and will be elaborated on in this section.

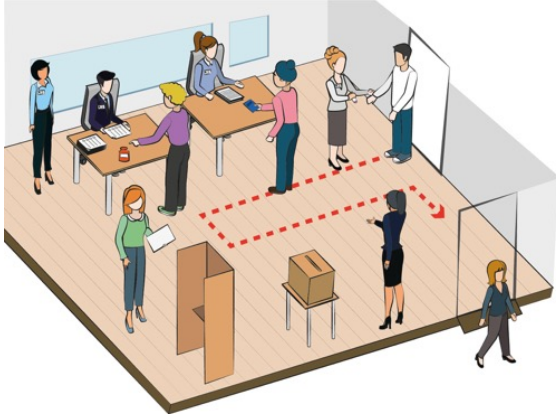
The most commonly used method to apply indelible ink is to mark one of the fingers of the voter. As with other tools, the value is dependent upon the users. Inconsistent application in Georgia's 2003 elections was one of a few reasons cited for the need to run fresh elections in 2004. Without proper training or careful execution, common mistakes may occur, some of which are outlined in the case studies in Annex 2. These include:

- not checking fingers for traces of ink;
- not checking the proper finger;
- not inking the proper finger;
- not applying ink consistently to every voter;
- not inking the voter's finger fully or in the right place;
- not providing ample time for the ink to dry, which not only effects the indelibility of the applied ink but may result in invalidation of ballots should they be smudged;
- leaving ink markers with the cap off causing the markers to dry up; and
- confusing the indelible ink with ink for writing or marking ballots.

In addition to poll worker training to mitigate malfeasance or fraud, polling station layout should be designed to allow the process of checking the voter and inking the voter's finger to be smoothly incorporated into other voting procedures. The finger of a voter can be inked at several points along the process.



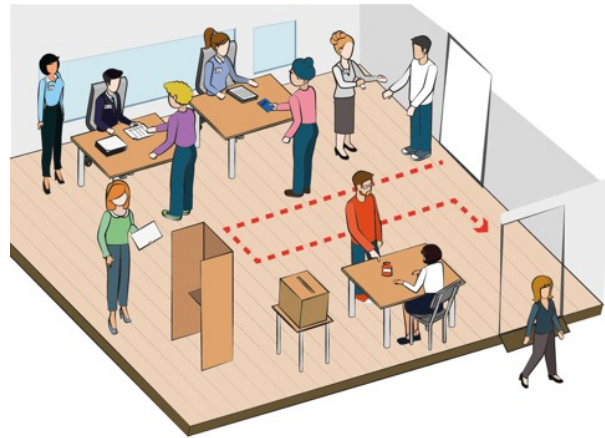
During the 2013 Constituent Assembly elections in Nepal, the Election Commission conducted a voter education campaign to familiarize voters with electoral procedures and equipment. Among other materials, a series of posters was developed and utilized featuring the application of electoral ink on voters' left thumb (right upper corner).



Poll workers apply ink to the finger of the voter before he or she receives a ballot paper.

The picture on the left portrays a common layout, when voters are checked for an inked finger when they present their identification. In the image to the left, poll workers apply ink to the finger of the voter before he or she receives a ballot paper. This approach may create a situation where the ink has not dried and risks staining the ballot, creating the possibility for the ballot to be considered invalid. To mitigate the risk of spoiled ballots, in some cases voters are given tissues to wipe excess ink from their finger. This is effective only if the ink dries before the voter wipes his or her finger.

Applying ink after the voter has cast the vote will reduce the likelihood of smudging or smearing of ballots with ink-marked fingers and thereby spoiling the ballots. In the image to the right, the voter casts their ballot, then proceeds to get his or her finger inked, allowing sufficient time for the ink to dry before leaving the polling station. Using this layout, in exceptional cases, the voter may refuse to have his or her finger inked.



The voter casts their ballot and then proceeds to get his or her finger inked.

Most ink producers recommend that the ink must be left to dry for three to four minutes after application to the finger to guarantee that it will thereafter be resistant to attempts to remove it with water, soap, liquids, household cleaning agents, detergents, bleaching products, alcohol, acetone or other organic solvents. This requirement should also be taken into consideration when designing polling station layout.

In addition to layout of the polling station, a few other factors are important when it comes to placement and usage. If using bottles of ink, each bottle should have a piece of sponge inserted to ensure adequate application. The bottle should be placed on a table at the location where inking will occur. The bottle may be secured to the table with an adhesive to avoid accidental spillage. The polling clerk on duty must ensure that each voter dips their finger properly into the bottle and that the finger is sufficiently covered with ink. If the ink coverage is insufficient due to low levels of ink in the bottle, the polling clerk should immediately replace the bottle. Having properly dipped the finger into the ink bottle, the voter shall then move to an allocated space and wait there to ensure the ink reacts completely with skin and cuticle. It is also recommended to shake ink bottles at regular intervals to ensure better application.

When using ink containers with a sponge, it is recommended that voters dip their finger from the fingertip, over the cuticle, until the first joint of the finger. When using a brush or a marker, the ink should be applied as if the lower part of the fingernail is painted, down to where the nail is attached to the finger by the cuticle. When using a spray, the ink spray should be carefully aimed and sprayed near the cuticle of the finger. In all cases, the cuticle should be covered by the ink as it is the area of the finger that provides for the longest-lasting, indelible mark.

In specific cases where proxy voting is allowed, the procedures should include instructions about inking the fingers of a proxy.



During Pakistan's May 2013 general elections, the cuticle of a voter's thumb was marked with indelible ink to prevent multiple voting. This procedure was used after voter verification and before polling throughout the country, including at the male polling station in Islamabad, Pakistan, pictured here.

Separate consideration shall be made to ensure that procedures are applicable for voters with physical disabilities. For example, the *Handbook for Returning Officers*, prepared by the Election Commission of India in 1992, states: "If an elector has no left forefinger, then indelible ink should be applied on any such finger, which he has on his left hand starting with his left forefinger. If he does not have any fingers on his left hand, the ink should be applied on his right forefinger and if he has no right forefinger, on any other finger which he has on his right hand starting with his right forefinger. If he has no fingers on either hand, ink should be applied on such extremity (stump) of his left or right hand as he possesses."

Election Commission of India, Handbook for Returning Officers, July 1992

Composition

Indelible ink is most commonly composed of silver nitrate (AgNO_3) and dye. The mix of these is important given that silver nitrate can be dangerous in large doses. For silver nitrate-based indelible ink, other ingredients often include distilled water, pigments, alcohol (to speed up the drying process), and possibly biocide and buffering agents. The supplier must specify the percentage of silver nitrate and each piece or packaging should be labeled accordingly. For electoral purposes, indelible ink can be purchased at different concentration levels but should not exceed 25 percent silver nitrate. Silver nitrate is also sometimes called lunar caustic or silver salt. It is an irritant to human skin, and in its pure solid form, it has been used as a cauterizing agent.⁹



A Libyan man dips his finger in ink during the Constitutional Drafting Assembly elections on February 20, 2014.

Higher concentrations help to ensure the indelibility of the stain by leaving a darker mark; however, they increase the cost and risk of irritation due to excessive exposure among polling officers as it can be harmful to human health.¹⁰

Discoloration comes from a combination of the skin being lightly burned and the silver nitrate changing colors, which becomes fully effective when exposed to sunlight. Depending on the concentration, the discoloration usually remains on the skin for several days, and on the cuticle for as many months as it takes for the fingernail to grow anew. For this reason, the ink should not be exposed to direct sunlight before use and it should be stored in fully opaque containers.

The required concentration of silver nitrate must be present in the final ink extracted from the bottles with the sponge inserted. An EMB should be aware that, in some cases, sponge applicators tend to slowly dissolve if left inside the bottle for too long. According to a chemist interviewed for this study, the sponge would start deteriorating after four months, depending on the composition of the ink and the sponge.

The dye helps the official see that the ink covered the proper area. This dye can be different colors, such as green or blue, but violet is the most common.

⁹ International Labor Organization, International Chemical Safety Cards – Silver Nitrate: http://www.ilo.org/dyn/icsc/showcard.display?p_card_id=1116&p_version=1&p_lang=en

¹⁰ This can be evidenced by the United States Food and Drug Administration amending the food additive regulations to provide for the safe use of an aqueous solution of silver nitrate and hydrogen peroxide as an antimicrobial agent in bottled water. <http://www.gpo.gov/fdsys/pkg/FR-2009-03-18/pdf/E9-5852.pdf>

Due to the caustic nature of silver nitrate in incorrect doses, election experts have started to discuss the possibility of using alternative components to produce indelible ink. This could prevent incidents such as in India, where a polling officer had experienced “swelling, pain, and redness over all the fingers”¹¹ due to the need to apply ink on voters during Election Day.¹² In Zimbabwe during the 2013 referendum, polling officers were reportedly hospitalized due to an adverse reaction to the ink.¹³ The problem could have been an incorrect composition of the ink, with a higher percentage silver nitrate.

There is ongoing research to identify an alternative to silver nitrate-based indelible ink that would have the same or similar effects and at the same cost. Indelible ink without silver nitrate should be subject to the same requirements of quality and shelf-life. Leading researchers argue that two plant extracts (*atsuete* and *kasubha*) mixed with cartridge ink can be used as alternative indelible ink. As all the components are available on the market in many countries, this composition could simplify the production of indelible ink.¹⁴ In parallel, research is ongoing with the current focus on beet root as an alternative solution.

¹¹ Mishra S., Agrawal K., Kumar S. and U. Sharma, “Indelible voters’ ink causing partial thickness burn over the fingers.” Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4292141/>

¹² The problem could be mitigated by providing protective gloves for polling workers in charge of ink application.

¹³ “Polling officers react to indelible ink.” Available at: <http://www.herald.co.zw/polling-officers-react-to-indelible-ink/>

¹⁴ Co D., De Fiesta I., and I. Odivilas, *Substitute indelible ink using Bixa orellana L. (ANNATTO) and Corcus sativus L. (KASUBHA) Extracts*. Available at: http://teacherplant.weebly.com/uploads/5/0/9/1/50912219/ls_2_paper-cavite_nhs.pdf

Types of Ink

There are different types of ink – invisible and visible – and a number of different delivery mechanisms – finger dipping, brush, marker and spray.

Visible and Invisible

While using indelible ink contributes to election integrity, staining a finger may be perceived differently in different societies. In some countries, a finger marked with indelible ink represents citizen participation or is a ceremonial symbol of Election Day that provides a visual “I voted” signal to others, as was the case in India and Myanmar. In others, such as Afghanistan, it can signify participation in a controversial vote, contributing to voter insecurity and exposing voters to the risk of electoral violence. In Zimbabwe in 2008, people who did not vote in the elections, and thereby did not have their fingers inked, were attacked by government-sponsored mobs.¹⁵ In the Philippines, voter harassment was reported with rival teams forcing people to put indelible ink on their finger to prevent them from voting.¹⁶ In 2009, observers reported cases in Afghanistan, where Taliban forces cut off ink-stained fingers of voters because they cast a vote.¹⁷

This topic is covered in the study *Election Ink and Turnout in a Fragile Democracy*, which argues that “inking makes the decision to vote visible.”¹⁸ By rendering the decision to vote visible by using visible ink, inking enables politicians and other actors to condition rewards and punishments on the presence of an inked (or “un-inked”) finger. Consequently, whether a finger is inked or not may become a sign of civic participation or civic protest.

Countries should consider whether there are safety concerns with this visual cue before opting for visible or invisible ink, which is used in a handful of countries around the world. If invisible ink is used, special UV LED lights are required to check the marks.

If invisible ink is chosen, regardless of delivery method, a UV LED lamp or torch must be used to detect whether voters have been previously marked as the stain is visible only if exposed to UV light. Special attention must be paid to the fact that the lamps and torches use widely available nickel-metal hydride batteries as their power source. It is recommended that suppliers provide spare batteries and lamps which should be distributed to each polling station. In its Statement on 2005 Parliamentary Elections in Kyrgyzstan, the European Network of Election Monitoring Organizations (ENEMO) noted, “in some

¹⁵ Sinha A., *Smart-Vote: Digital Election Ink Based Voting System*. Available at:

http://iieng.org/images/proceedings_pdf/3218ER1015102.pdf

¹⁶ “Vote-buying, ‘indelible ink’ operations rampant in Manila, claim bets.” Available at:

<http://newsinfo.inquirer.net/784053/vote-buying-indelible-ink-operations-rampant-in-manila-claim-bets>

¹⁷ “Taliban cut off Afghan voters’ ink-stained fingers, election observers say.” Available at:

<http://articles.latimes.com/2009/aug/23/world/fg-afghan-election23>

¹⁸ Ferree K., Down R., Jung D., Gibson C., *Election Ink and Turnout in a Fragile Democracy*, December 2015.

Available at:

http://static1.squarespace.com/static/55af94b0e4b0cc8a396f8c40/t/56f52f261330ba72a8aec682/1458908967066/Inking_1215.pdf

cases, the UV-lamp examination equipment went out of order and voters were allowed to vote without first being examined for an ink mark.”¹⁹ The result of using ink is invalid if lamps or batteries are not of good quality and do not detect ink on voters’ fingers.

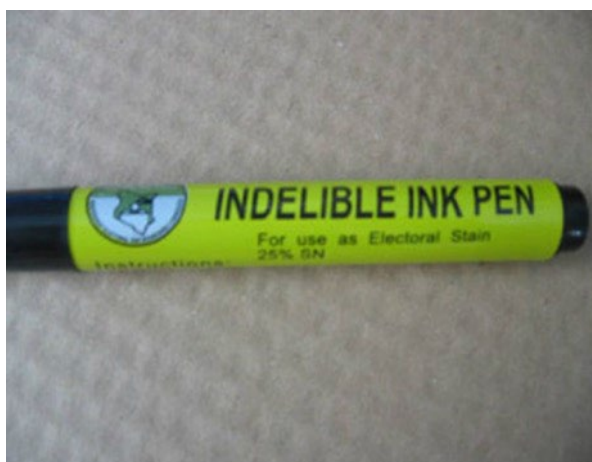
Delivery Mechanism

Marker pens, brushes, dip bottles with sponges and spray bottles are used by different countries to administer the ink. IFES research shows the majority of countries use ink use dip bottles, a minority use brushes, and a small handful use sprays and market pens (See Annex 1).

For a **bottle delivery mechanism**, a cross-cut sponge should be inserted into the bottle for dipping the voter’s finger directly onto the sponge. The sponge will support the even distribution of different liquids in the bottle. The sponge will also provide tactile feedback on how deep the voter’s finger has been dipped (until first joint), and thereby save ink. To counter silver nitrate’s caustic properties, the sponge material or bottle plastic material must be designed not to react with or retain silver nitrate in its fibers, which can alter the concentration of silver nitrate available in the ink.

The supplier should be required to state the shelf life in writing as part of contract specifications and the ink should be packed for airfreight in sealed and capped bottles resistant to changes in pressure during air transport.

When the **delivery mechanism is a marker**, the marker pens must provide a fluid flow of ink appropriate to deliver clear and sufficient marking. The pen cap should be able to remain off without the pen drying up for at least two hours. The acidity level, or pH, should be 4.5 (± 10%). The ink level should be at a minimum five milliliters. The supplier should be required to advise on the approximate number of voters who can be marked with one marker. A test should be conducted by the EMB as well. During the storage period, pens and packages must maintain their original characteristics. Marker pens are usually cheaper and easier to transport.



Indelible ink marker pen for elections

Brush-on solutions use less ink than the sponge application but can be more difficult to apply and require more attention during the training of polling staff.

¹⁹ Kibble S. and M. Walls, *Report by International Election Observers on the 2012 local elections in Somaliland*, November 2012. Available at: <http://www.progressio.org.uk/sites/progressio.org.uk/files/Swerves-on-the-road-2013.pdf>

Production, Packaging, Testing and Disposal

Given the importance that each indelible ink container be delivered to the polls in working condition, the production, packaging and delivery are critical. EMBs must understand these needs in order to make effective procurement decisions and must oversee the process from start to finish.

Production and Packaging

It is recommended that ink containers be packed in strong cardboard boxes or sturdy ziplock bags and labeled according to the appropriate hazard classification system.²⁰ Sturdy ziplock bags are often used when delivering the ink to individual polling stations, especially when the ink is prepackaged in polling center kits. The delivery mechanisms for indelible ink include bottles, marker pens, spray and brush. Flagging the necessity to label *both* the packaging and the bottle/pen/marker/spray itself is important to ensure that polling staff receive the information on Election Day, even if they have not been properly trained.

The ink is flammable and should be treated accordingly during transport and while in storage. The top of the bottle should be sealed with a resistant heat-induction hermetic seal to prevent leakage, in addition to a reliable screw cap. It is advisable to avoid use of desiccation crystals or other moisture absorption packages in shipment or storing of the ink, as these can induce premature drying of the ink.

Suppliers should be required to deliver indelible ink in lightproof, opaque, strong plastic bottles²¹ to prevent premature reaction to light and spoilage.

The shelf life of indelible ink should be sufficient to meet the requirements of the electoral calendar as specified in the procurement requirements. Storage instructions should be strictly followed. An expiry date should be clearly marked on all containers. The supplier must advise and provide necessary packing if ink is considered dangerous or hazardous under national, state or local laws. Bottles must be labeled with customized text.



Indelible ink bottles

²⁰ http://www.unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev04/English/ST-SG-AC10-30-Rev4e.pdf

²¹ For plastic bottles, it is strongly recommended to state the percentage of recycled plastic material used and confirm that no variation in performance or interaction with the ink is caused by the use of recycled plastic for the bottle.

Testing

Testing indelible ink in accordance with a thoroughly prepared plan or protocol is necessary. It should take place well in advance of Election Day so that voters can participate in the testing and to leave sufficient time for the EMB to rectify problems that might occur. External stakeholders should be also involved in the testing process. Procedures for testing ink differ nationally. According to standards in India,²² a test to determine that the composition of the ink is correct should first be conducted, followed by tests for resistance to bleaching and organic solvents. Observer reports in Somaliland and Malaysia reported watching voters easily remove ink (Annex 3). It is recommended that ink should be subject to the same level of thorough testing before each election.

Consider a public check and a media event around testing of the ink quality and ink application procedures. To avoid public display of ineffective ink, it should be thoroughly pre-tested well in advance of the public check. Such an event is a one-time opportunity to provide maximum attention and build trust for the inking mechanism to counter potential political, security, administrative, financial and integrity concerns. National observers, political parties, civil society and the media should be invited to such testing.

Disposal

Due to the composition of indelible ink, proper disposal is also an important consideration.²³ Requirements for disposal of indelible ink are set out by the Organisation for Economic Co-operation and Development (OECD), the ISO and the Occupational Health and Safety Standards.²⁴ To combat negative environmental effects resulting from the use of indelible ink, there have been discussions among practitioners in recent years as to whether instituting a buy-back program is possible to incentivize the proper disposal of used ink and containers. Until buy-back programs become standard practice, various sources recommend using a certified and reliable disposal company in accordance with national, state and local environmental control regulations. Ink producers should be required to provide information and details for disposal of indelible ink items, especially silver nitrate ink and used bottles.

At present, most disposal processes are conducted in developed countries. Shipping such materials out of a developing country must be assessed on an ad hoc basis; using sea freight is more affordable and seems to be the usual practice when environmental requirements are to be observed. An EMB could contact national ministries of industry or environment for advice, or disposal could be coordinated with EMBs in neighboring countries. In such cases, the old stock should be clearly separated and labeled to

²² Indian Standard Indelible Ink - Specification including testing, 1991. Available at: <https://ia801009.us.archive.org/35/items/gov.in.is.13209.1991/is.13209.1991.pdf>

²³ Malaysia case destroying ink by burning: "Indelible ink burning an indelibly burning question," 2009. Available at: <https://www.malaysiakini.com/letters/120492>; Guyana case of disposing the ink into a river: Carl Dundas, *My Wonderful World of Elections: An Election Autobiography*, 2011

²⁴ OECD, *Trade measures on the Basel Convention on the Control of transboundary movement of hazardous wastes and their disposal*, 1998. Available at: <http://www.oecd.org/trade/envtrade/36789048.pdf>; Basel Convention, 1989. Available at: <http://www.basel.int/portals/4/basel%20convention/docs/text/baselconvention-text-e.pdf>; OECD, *Guidance Manual on Environmentally Sound Management of Waste*, 2007. Available at: <https://www.oecd.org/env/waste/39559085.pdf>

avoid accidental reuse after the expiry date. When indelible ink is disposed through incineration, the silver, as the most expensive part of the solution, should be reclaimed. More research is expected and anticipated through independent institutions. Safe procedures are expected of all vendors.

If not handled properly, indelible ink in the current composition is hazardous and proper, environmentally friendly disposal procedures should be in place whenever the ink is used.

Summary of Considerations

Indelible ink when properly used can be an effective safeguard against multiple voting, especially if used in combination with other methods. When improperly used it carries risks of creating new electoral vulnerabilities.

Election administrators and legislators, in coordination with other stakeholders, should consider the many factors outlined in this document before deciding on the use of indelible ink. They must ensure all necessary conditions can be met before deciding to use indelible ink.

This paper offers the following considerations for electoral administrators contemplating the adoption or improvement of indelible ink processes:

- There are valid pros and cons that should be considered on a case-by-case basis;
- Although dipping bottles require more ink, they are often the preferred option as they instantly create a visible mark and electoral officials are more likely to apply the ink properly;
- The indelible ink mark must last longer than the period of voting. This is particularly important if voting lasts more than one day;
- The ink must be safe for the health of voters and polling staff, with no more than 25 percent silver nitrate;
- Sufficient quantities of indelible ink must be in supply;
- Indelible ink must be procured to arrive well in advance of elections to allow for distribution, testing, training and public outreach campaigns. The ink's shelf-life must be considered;
- If ink is only visible under UV light out of concerns of electoral violence or individual integrity, functional UV lamps and spare batteries should be supplied to each polling station. Additional costs should be considered to accommodate this form of inking;
- Manufacturers should supply ink to an EMB in leak-proof, security-sealed containers made of high-quality materials to avoid distortion of the silver nitrate level. Both packaging and bottles need to be properly labeled in the local language(s);
- Training of polling officials is crucial and should be thoroughly implemented;
- Consider a public check and a media event around testing of the ink quality and ink application procedures;
- Ink should be thoroughly pre-tested to ensure correct composition, that it cannot be removed from the finger for the required time period, and correct usage;



A voter shows his inked finger after voting in Indonesia's 2014 legislative elections. The General Election Commission used silver-nitrate based ink to mark each voter's finger after voting as an anti-fraud instrument to prevent multiple voting.

- The EMB should ensure the public is well-prepared to accept indelible ink as a method to prevent multiple voting, especially in societies with significant cultural resistance toward using ink, by delivering messages and fostering debates with participation of observers and political parties about the usage of indelible ink so the mechanism is accepted on Election Day as part of election integrity; and
- Finger inking should be adopted as only one aspect of a larger anti-fraud strategy.

Annex 1: Overview of Usage of Indelible Ink in the World²⁵

Country	Application Method				Type of Ink		In the Law
	Finger Dip	Brush	Spray	Marker Pen	Visible	Invisible	
Afghanistan	x				x		
Albania		x			x		x
Algeria					x		x
Angola	x				x		x
Antigua and Barbuda	x				x		x
Azerbaijan						x	x
Bahamas	x				x		x
Bangladesh				x	x		x
Belize	x				x		x
Bhutan				x	x		x
Botswana	x				x		
Burkina Faso		x			x		x
Burundi	x				x		x
Cambodia	x				x		
Cameroon					x		x
Central African Republic					x		x
Chad	x				x		x
Chile	x				x		
Congo					x		x
Côte d'Ivoire	x				x		
Djibouti	x				x		x
Dominican Republic	x				x		x
Democratic Republic of the Congo		x			x		x
East Timor	x				x		
Egypt	x				x		x
El Salvador		x			x		x
Equatorial Guinea					x		
Ethiopia	x				x		x
Fiji	x				x		x
Gabon							x
Gambia					x		x
Ghana					x		
Georgia		x				x	x
Grenada	x				x		x
Guatemala	x				x		x

²⁵ The survey was conducted by IFES staff in December 2017.

Country	Application Method				Type of Ink		In the Law
	Finger Dip	Brush	Spray	Marker Pen	Visible	Invisible	
Guinea-Bissau							X
Guyana	X						X
Haiti							X
Honduras	X				X		X
India		X			X		X
Indonesia	X				X		X
Iran					X		
Iraq	X				X		
Jamaica	X				X		X
Jordan	X				X		X
Kenya	X				X		
Kosovo		X			X		
Kyrgyzstan			X			X	
Lebanon	X				X		X
Lesotho	X				X		
Liberia	X				X		
Libya	X				X		
Republic of North Macedonia			X			X	X
Madagascar							X
Malawi	X				X		X
Malaysia		X			X		
Maldives					X		
Mali		X			X		
Mexico					X		X
Mongolia		X			X		
Montenegro						X	X
Morocco		X			X		X
Mozambique	X				X		
Myanmar	X				X		
Namibia						X	X
Nepal		X			X		
Nicaragua	X				X		X
Niger							X
Nigeria		X			X		
Pakistan					X		X
Palestinian National Authority		X			X		X
Paraguay	X				X		X
Philippines		X					
Rwanda	X						

Country	Application Method				Type of Ink		In the Law
	Finger Dip	Brush	Spray	Marker Pen	Visible	Invisible	
Saint Lucia	x				x		x
Serbia			x			x	x
Senegal							x
Sierra Leone	x				x		x
Solomon Islands							x
South Africa				x			
Sri Lanka	x				x		
Sudan	x				x		
Suriname		x			x		
Syria	x				x		
Trinidad and Tobago	x				x		x
Tunisia	x				x		
Turkey				x	x		x
Uganda		x			x		x
Venezuela	x				x		
Yemen	x						
Zambia		x			x		x
Zimbabwe	x				x		

Annex 2: Examples of Use of Indelible Ink – Country Cases

India: The rationale behind the introduction of indelible ink is usually the failure to deliver acceptable results, followed by allegations of misconduct and fraud related to identity theft and multiple voting. This was the issue in India during the first democratic elections in 1951-52, where identity theft as one of their biggest concerns. To protect people from casting their vote multiple times they reached out to the National Physical Laboratory's team of scientists to develop a solution. During the third election in 1962, the Indian government started using indelible ink and has used ink to counter multiple voting ever since. First-time voters were excited to share pictures of their inked fingers to demonstrate their active public participation. Some media conducted campaigns to encourage voters to participate in elections and then, as they wrote: "Let your friends and family know — the more inked fingers we can see, the greater the understanding of how this election affects different parts of the country."²⁶

Bosnia and Herzegovina: Any citizen, aged 18 or older, whose name appeared on the 1991 census for Bosnia and Herzegovina, was eligible to vote in the first post-conflict parliamentary and presidential elections in 1996. This provision included refugees living abroad, as well as displaced persons residing within Bosnia and Herzegovina. Deficiencies on the voter list could have seriously undermined the integrity of the vote, and the only way to prevent multiple voting and identity theft was to introduce indelible ink. However, in the following years, as the situation stabilized, and a new voter registration process was undertaken in conjunction with re-establishment of the civil register, the EMB decided not to use indelible ink going forward.

Republic of North Macedonia: In 1998, 15 political parties signed a petition prepared by the Internal Macedonian Revolutionary Organization – Democratic Party for Macedonian National Unity (VMRO-DPMNE) to hold "A Fair and Democratic Election," asking election authorities to use ink stain to avoid duplicate votes. At that time, the Securities and Exchange Commission categorically refused, stating that this mechanism was unnecessary and would represent an "insult" to Macedonian voters.²⁷ However, as the problems with irregularities in the voter list became evident, Parliament introduced provisions regarding the use of indelible ink into legislation.

Afghanistan: In Afghanistan in 2004, indelible ink was used following reports of excess voter registration cards circulating on the black market. Some estimates suggested there was between 10 and 20 percent duplicate registration. Punching holes in the registration card was to be the primary method of preventing multiple voting, but due to the commonplace practice of multiple registrations, the Joint Electoral Management Body decided to apply ink on the left thumb of voters to prevent multiple voting.²⁸ For Election Day, kits provided for the polling stations contained ink in the form of an ordinary

²⁶ "Voters in India: show us the ink on your fingers." Available at:

<https://www.theguardian.com/world/2014/apr/11/voters-in-india-show-us-ink-on-your-fingers-elections>

²⁷ OSCE/ODIHR Election Observation Mission Final Report. Former Yugoslav Republic of Macedonia, Parliamentary elections October 18 and November 1, 1998. Available at:

<http://www.osce.org/odihr/elections/fyrom/15887?download=true>

²⁸ Morgan, M.J. *A Democracy is Born: An Insider's Account of the Battle Against Terrorism in Afghanistan*, 2007. Available at:

water-soluble marker, with “permanent marker” written on it, for general use, in addition to the marker for inking fingers. In some cases, polling staff confused the two markers and voters inked with the “permanent marker” were potentially able to wipe the ink off. The extent of the confusion was limited and not sufficient to cause any serious alteration of the results. Confusion among stakeholders and its potential destabilizing force were however more significant than any real fraudulent impact.²⁹ In 2009, the UN special representative to Afghanistan, Kai Eide, held a press conference to reiterate the importance of indelible ink and demonstrated the usage of such ink on his own fingers.³⁰

Suriname: In the Surinamese legislative election of 2005, orange replaced violet as the color for marking the voters’ fingers since it was allegedly found to last just as long and be more appealing to voters because it resembled national colors.

Myanmar: In 2015, indelible ink was used in Myanmar for the first time. One of the controversial aspects of the pre-electoral period was a potential lack of accuracy of the voter list. The risk of multiple voting and impersonation was highlighted as a possible consequence. Introduction of ink has greatly contributed to reinforcing the integrity of elections and increasing voter confidence in the credibility of the electoral process by eliminating this risk. Indelible ink was widely seen as a very positive part of the process and became one of the most powerful symbols in general elections with pictures of voters proudly showing their inked finger on the Internet and social media.³¹

Cambodia: The National Election Committee introduced indelible ink for polling stations in the capital. Instructions on inking were communicated to precinct election commissions and this last-minute procedural change was consistently implemented in all polling stations visited by election observers. However, the use of ink is a largely superfluous practice when voters are already authenticated through biometric verification. Using this mitigation measure against multiple voting on only a select group of voters in the capital is also questionable. Moreover, this practice potentially undermines the confidence in technologies already employed.³²

Georgia: In 2004, the Central Election Commission (CEC) was forced to conduct fresh national elections after the November 2003 elections were widely criticized for multiple voting, widespread fraud and inconsistent application of voter ink. As an anti-fraud measure, the CEC quickly procured a fresh supply of invisible voting ink and UV lamps and committed to more thorough application. However, distrust of the electoral process was strong among Georgians, hence rumors spread that the ink was toxic or could cause impotence. There were further claims among detractors that the ink could be considered the

https://books.google.com.ua/books?id=HnkjNpP2tQQC&printsec=frontcover&hl=uk&source=gbs_atb#v=onepage&q&f=false

²⁹ *Methodological Guide on Electoral Assistance*. Available at:

https://ec.europa.eu/europeaid/sites/devco/files/election-assistance-methodological-guide_en.pdf

³⁰ “Afghanistan election: ‘indelible’ ink washes off voters’ fingers.” Available at:

<http://www.telegraph.co.uk/news/worldnews/asia/afghanistan/6061343/Afghanistan-election-indelible-ink-washes-off-voters-fingers.html>

³¹ “UNDP Provided Indelible Ink in Myanmar Elections: A Powerful Integrity Tool.” Available at:

<http://www.mm.undp.org/content/myanmar/en/home/presscenter/pressreleases/2015/11/25/undp-provided-indelible-ink-in-myanmar-elections-a-powerful-integrity-tool-.html>

³² <https://www.phnompenhpost.com/national/indelible-ink-be-used-polls-put-test>

“mark of the devil” by individual members of the Orthodox Church of Georgia. In an extraordinary press event, the chair of the CEC appeared on live television asserting she could personally attest that the ink did not cause impotence. This was quickly followed by the patriarch of the Orthodox Church of Georgia stating in an interview that the church neither had issues with marking of fingers for voting, nor would it be considered the “mark of the devil.” Ultimately voters turned out in large numbers to elect a new Parliament and a president.

Observation and Media Reports Regarding the Use of Indelible Ink

Indelible ink is not often mentioned in media or observation reports if no problems occur. However, in cases where problems have been observed, national and international election observation groups have included it in their reports, prompting debates regarding the use of indelible ink and pinpointing specific problematic areas where a review of procedures is required. Examples of problems and challenges are presented below.

Improper implementation of procedures by polling staff: In its final report, the Organization for Security and Co-operation in Europe/Office for Democratic Institutions and Human Rights (OSCE/ODIHR) Election Observation Mission in Azerbaijan in 2008 noted that in some cases “*voters who had already been marked with invisible ink were still allowed to vote.*”³³ The same is reflected in the European Union (EU) Election Observation Mission Final Report for Rwanda in 2008: “*Checking for traces of ink before issuing a ballot paper was not performed in 67% of observations.*”³⁴ The OSCE/ODIHR Election Observation Mission in Georgia in 2016 stated, “*a few serious irregularities were observed, including voters with traces of invisible ink allowed to vote (2 per cent).*”³⁵ As noted by the National Democratic Institute (NDI) and International Republican Institute (IRI) in Togo in 2005, “*the team noted that the ink was being applied inconsistently. At one polling station, officials were only applying the ink to new voters. At other polling stations visited, officials were applying ink to all voters.*”³⁶

Quality issues: The report by Progressio on the 2012 local elections in Somaliland notes that, “*the ease with which indelible ink was removed may have permitted a substantial number of voters to cast multiple ballots, potentially reducing the integrity of results.*”³⁷ The same report included a recommendation that “*if ink is to be retained as a safeguard of election integrity, then it should be trialed in advance and tested for durability to bleach removal, and for the ease with which it can be distinguished from henna and decorative stains.*” In its Statement on 2005 Parliamentary Elections in

³³ OSCE/ODIHR Election Observation Mission Final Report. Republic of Azerbaijan, Presidential election October 15, 2008. Available at: <http://www.osce.org/odihr/elections/azerbaijan/35625?download=true>

³⁴ EU Election Observation Mission Final Report, Republic of Rwanda 2008. Available at: http://www.eods.eu/library/FR%20RWANDA%202008_en.pdf

³⁵ OSCE/ODIHR Election Observation Mission Final Report. Georgia, Parliamentary election, October 8 and 30, 2016. Available at: <http://www.osce.org/odihr/elections/georgia/297551?download=true>

³⁶ Report of the Joint IRI, IFES and NDI Togo Assessment Mission, 2005. Available at: https://ifes.org/sites/default/files/cepps_togo_final_report_0.pdf

³⁷ Kibble S. and M. Walls, Report by International Election Observers on the 2012 local elections in Somaliland, November 2012. Available at: <http://www.progressio.org.uk/sites/progressio.org.uk/files/Swerves-on-the-road-2013.pdf>

Kyrgyzstan, ENEMO noted, “in some cases, the UV-lamp examination equipment went out of order and voters were allowed to vote without first being examined for an ink mark.”³⁸ During the Malaysian national elections in 2013, at early voting stations in Kuala Lumpur, independent election observers witnessed the indelible ink being removed with hand sanitizer or soapy water.³⁹

Electoral violence: In some countries, the application of ink could threaten the lives of voters. In Zimbabwe, in 2008, citizens who did not vote in the elections, and thereby did not have their fingers inked, were attacked by government-sponsored mobs.⁴⁰ In the Philippines, voter harassment was reported with rival teams forcing people to put indelible ink on their finger to prevent them from voting.⁴¹ In 2009, observers reported cases in Afghanistan, where Taliban forces cut off ink-stained fingers of voters because they cast a vote.⁴²

³⁸ Kibble S. and M. Walls, *Report by International Election Observers on the 2012 local elections in Somaliland, November 2012*. Available at: <http://www.progressio.org.uk/sites/progressio.org.uk/files/Swerves-on-the-road-2013.pdf>

³⁹ ENEMO, “Statement on 2005 Parliamentary Elections in Kyrgyzstan.” Available at: <http://www.enemo.eu/old/kyrgyzstanparl2005.htm>

⁴⁰ Sinha A., *Smart-Vote: Digital Election Ink Based Voting System*. Available at: http://iieng.org/images/proceedings_pdf/3218ER1015102.pdf

⁴¹ “Vote-buying, ‘indelible ink’ operations rampant in Manila, claim bets.” Available at: <http://newsinfo.inquirer.net/784053/vote-buying-indelible-ink-operations-rampant-in-manila-claim-bets>

⁴² “Taliban cut off Afghan voters' ink-stained fingers, election observers say.” Available at: <http://articles.latimes.com/2009/aug/23/world/fg-afghan-election23>

Annex 3: Resource Guide on Indelible ink

This resource guide is divided into two categories: 1) general literature on indelible ink and 2) international law and standards.

General Literature

- Co D., De Fiesta I., and I. Odivilas, *Substitute Indelible Ink Using Bixa Orellana L. (ANNATTO) and Corcus Sativus L. (KASUBHA) Extracts*. Available at: http://teacherplant.weebly.com/uploads/5/0/9/1/50912219/ls_2_paper- cavite_nhs.pdf
- *Election Ink: Mechanism Based Reaction in the Playground of Functional Groups of Chemistry on Biochemistry*, 2014. Available at: www.wjpps.com/download/article/1401539682.pdf
- Ferree K., Down R., Jung D., Gibson C., *Election Ink and Turnout in a Fragile Democracy*, December 2015. Available at: http://static1.squarespace.com/static/55af94b0e4b0cc8a396f8c40/t/56f52f261330ba72a8aec682/1458908967066/Inking_1215.pdf
- Ferree K., Down R., Jung D., Gibson C., *Experimental Evidence on the Effects of Indelible Inking on Turnout in a Fragile Democracy*, October 2013. Available at: https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=CSAE2014&paper_id=279
- United Nations Development Programme, *Programme and Operations Policies and Procedures - Procurement*. Available at: <https://popp.undp.org/SitePages/POPPBSUnit.aspx?TermID=254a9f96-b883-476a-8ef8-e81f93a2b38d&Menu=BusinessUnit>

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Acronyms and Abbreviations

EMB	Election Management Body
ENEMO	The European Network of Election Monitoring Organizations
ISO	International Organization for Standardization
LED	Light-Emitting Diode
OECD	Organisation for Economic Co-operation and Development
UNDP	United Nations Development Programme
UN	United Nations
UV	Ultraviolet

About the Authors (in alphabetical order)

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Melika Atic is the deputy director for Asia-Pacific at IFES. With over 18 years of experience across the nonprofit and private sectors, she manages a diverse portfolio of IFES programs in the region. Prior to joining IFES, Atic spent four years with the Organization for Security and Co-operation in Europe (OSCE) working in elections and post-conflict development in Bosnia and Herzegovina.

While at the OSCE, Atic worked in various capacities on the first four post-war elections in Bosnia and Herzegovina, initially developing train-the-trainer modules for municipal and assembly elections and training over 300 international and local trainers and 2,000 international polling supervisors on polling and counting procedures. She later joined the senior management team in the chief of staff's office.

Since joining IFES, Atic has contributed to a wide array of technical assistance projects including building the world's largest national voter database in Indonesia, supporting the first local elections in 20 years in Nepal, and reestablishing IFES' presence in Sri Lanka. In addition, Atic manages the Elections Operations Knowledge Management Initiative group and is a member of the Information and Communications Technologies group.

Atic holds a bachelor's degree in political science and peace and conflict studies from Bryn Mawr College and a master's degree in international affairs from Columbia University.

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Peter Erben is a leading authority on electoral management and strengthening of democratic institutions. Erben is one of a few international experts called upon to direct national elections in other nations. Erben currently works out of Ukraine, where he is senior country director for IFES and senior adviser to the Central Election Commission. He has held similar positions in Indonesia, Pakistan, Nepal and Palestine.

He served as chief electoral officer of Afghanistan during the country's 2005 parliamentary and provincial council elections. Previously, he directed two out-of-country elections: the 2004 Afghan presidential election for Afghans living in Pakistan and Iran and the 2005 Iraqi parliamentary elections for Iraqis living in 14 countries, including Sweden, Syria, Jordan and the United States.

He was associate director of elections and the director of elections for the first two post-conflict elections in Kosovo in 2000 and 2001. In both Afghanistan and Kosovo, Erben was also a member of the election commission. From 1996-2000, Erben participated in managing the first four post-conflict elections in Bosnia and Herzegovina, serving as the Organization for Security and Co-operation in Europe's chief of staff in the final two years. Erben conducted missions to Myanmar, Libya, Iraq, Egypt, South Korea, Malaysia, Lebanon, the Philippines, Bangladesh, Sri Lanka, and Georgia.

In 2005, Erben received Afghanistan's Ghazi Mir Bacha Khan Superior State Medal; in 2008, he was knighted for contributing to the advancement of democracy worldwide. Erben is Danish and graduated from the Copenhagen Business School. He is a guest lecturer at Harvard and other universities.

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Anne-Sofie Holm Gerhard is an experienced electoral administration specialist with broad technical knowledge in the field of electoral assistance and electoral cycle support. She has solid experience in providing both elections advisory (strategic planning, formulation) and operational support (implementation). Holm Gerhard has worked 14 years in the United Nations (UN) system – with UN Peacekeeping Missions in Kosovo, Sierra Leone, Liberia, Afghanistan and Iraq, and the UN Political Mission in Nepal as well as with the United Nations Development Programme (UNDP) with UNDP/PSO, the EC-UNDP Joint Task Force and UNDP's Global Project for Electoral Cycle Support. In this context, she has undertaken numerous formulation and support missions. Holm Gerhard has worked with electoral commissions in 23 countries – Africa (14), Asia (4) and the Middle East (5). She worked for several years in sensitive post-conflict settings and with emerging democracies with the primary focus of strategic and operational guidance, knowledge development, training and capacity building of EMBs in the area of credibility, professionalism and sustainability of electoral institutions and their processes.

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Panto Letic has been working on elections and political transitions for the last 20 years in different regions of the world. He currently works with the United Nations (UN) focusing on out-of-country voting in Arab countries. He also works as an advisor with IFES in Ukraine providing support to the potential issues for the future elections in the areas where conflict took place.

He served as the UN chief electoral adviser in Libya, leading the team that was responsible for supporting the Libyan National Transitional Council in establishing preconditions for the first electoral process and the national election commission for three elections during the 2012-14 period. He also served as the senior operations adviser for the UN Mission in Sudan during the referendum for independence of South Sudan and three elections in Iraq between 2008 and 2010. Previously, he worked as a specialist for electoral processes in Nepal, Afghanistan, East Timor and Bosnia and Herzegovina.



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