

LAW ENFORCEMENT AGAINST THE MODUS OPERANDI OF HYDROPONIC MARIJUANA CULTIVATION IN DENSELY RESIDENTIAL AREAS IN THE JURISDICTION OF THE BALI REGIONAL POLICE

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Abstract

The development of narcotics crimes has significantly changed not only in illegal trafficking but also in cultivation methods utilizing modern agricultural technology. One emerging modus operandi is hydroponic cannabis cultivation conducted in densely populated residential areas. This method complicates law enforcement efforts because perpetrators employ legal agricultural equipment integrated with climate control systems, artificial lighting, irrigation, and CCTV surveillance. This empirical legal research aims to analyze law enforcement against hydroponic cannabis cultivation within the jurisdiction of Bali Regional Police and examine obstacles encountered during investigation and evidence collection. The research employs statutory, conceptual, and case approaches supported by interviews with investigators of the Bali Regional Police Narcotics Directorate. The findings indicate that law enforcement has been implemented under Law Number 35 of 2009 concerning Narcotics and the Indonesian Criminal Procedure Code. Nevertheless, investigators still face substantial challenges involving sophisticated cultivation technology, limited detection equipment, weak public participation, and complex evidentiary processes associated with transnational narcotics networks. Strengthening digital forensic capabilities, improving inter-agency coordination, and enhancing community participation are necessary to improve future law enforcement effectiveness.

Keywords: Law Enforcement, Narcotics, Hydroponic Cannabis, Investigation, Bali Regional Police.

INTRODUCTION

Indonesia is a state based on law, as affirmed in Article 1 paragraph (3) of the 1945 Constitution of the Republic of Indonesia. The consequence of this principle of the rule of law is that all aspects of social, national, and state life must be based on law, including efforts to prevent and eradicate crime. The law functions not only as an instrument of social control but also as a means of social engineering capable of responding to the various dynamics of crime developments along with advances in science and technology. Therefore, the state has a constitutional responsibility to provide protection to the public through an effective,

professional, and adaptive law enforcement system to address the ever-evolving nature of various forms of crime.

One form of crime that remains a serious concern, both nationally and internationally, is narcotics crime. Narcotics crime is no longer viewed as an ordinary crime but has evolved into an extraordinary crime due to its organized, transnational nature, the use of modern technology, and its far-reaching impact on public health, security stability, the economy, and national resilience. In fact, the United Nations Office on Drugs and Crime (UNODC) lists drug crime as one of the fastest-growing forms of transnational crime worldwide, fueled by international networks, advances in information technology, and the ease of digital financial transactions.

In Indonesia, drug abuse and illicit trafficking continue to show a worrying trend. This development is characterized not only by the increasing number of drug abusers but also by the increasingly diverse modus operandi used by drug networks to produce, store, distribute, and conceal narcotics. These changing crime patterns demonstrate that drug networks have the ability to adapt to technological developments, making conventional law enforcement methods often inadequate to uncover crimes.

One such development that is currently becoming more common is the cultivation of cannabis using hydroponic systems (hydroponic cannabis cultivation). Unlike conventional planting methods that require open fields, hydroponic cultivation utilizes modern agricultural technology, allowing cannabis plants to be cultivated indoors without direct sunlight. This system uses a special growing medium combined with liquid nutrients, artificial lighting (grow lights), room temperature control, automatic ventilation, air conditioning, humidity control, and an automatic irrigation system, allowing plants to grow optimally throughout the year.

The use of hydroponic technology offers various advantages for drug offenders. In addition to speeding up the harvest period and improving crop quality, the system also disguises cultivation activities, making them difficult to detect by the public and law enforcement. From the outside, the building used for cultivation appears to be a residence or ordinary building, but inside, it has been modified into a marijuana cultivation laboratory equipped with various modern technological devices. Thus, technological developments, originally designed to support the agricultural sector, are being exploited as a means to commit drug crimes.

This phenomenon demonstrates that technological development brings two distinct consequences. On the one hand, technology provides benefits for increasing productivity and public welfare, but on the other, it is also exploited by criminals to evade law enforcement surveillance. This situation requires law enforcement officials to develop law enforcement

strategies that rely not only on conventional investigative methods but also utilize technology-based law enforcement approaches.

This development of *modus operandi* is also occurring in Bali Province. As an international tourism destination, Bali has a very high population mobility and serves as a meeting place for people from various countries. This situation has a positive impact on regional economic growth, but also opens up opportunities for the development of various forms of transnational crime, including drug crimes. International drug networks exploit the high tourism activity as a means to expand their drug distribution networks, involving both foreign and Indonesian citizens.

One case that captured public attention was the disclosure of a hydroponic marijuana cultivation case by the Bali Regional Police Narcotics Investigation Directorate in 2025. In this case, authorities successfully uncovered a house in a densely populated residential area of Denpasar City that was being used by a foreign national to cultivate marijuana using a hydroponic system. The investigation uncovered dozens of marijuana plants, marijuana seeds, hydroponic equipment, a special lighting system, air conditioning, humidity control, CCTV, and various other supporting equipment, indicating that the cultivation was carried out professionally and in an organized manner.

The disclosure of this case demonstrates a shift in the pattern of narcotics crime from mere distribution to independent production activities utilizing modern technology. This undoubtedly presents a new challenge for law enforcement officials, as the investigation, search, seizure, and evidence collection processes require more complex technical skills than those used in handling conventional narcotics crimes. Investigators are not only required to understand aspects of criminal law but also must possess knowledge of hydroponic technology, digital forensics, electronic evidence examination, and financial transaction analysis used by the perpetrators' networks.

Law Number 35 of 2009 concerning Narcotics actually prohibits anyone who without the right to plant, maintain, possess, store, control, or provide narcotics class I in the form of plants as regulated in Article 111. However, technological developments used in hydroponic marijuana cultivation have created new challenges in the implementation of law enforcement. The use of agricultural equipment, which is essentially a legal item, requires investigators to be able to prove the connection between the equipment and the crime committed. In addition, proving electronic evidence, digital communications, and the involvement of perpetrators in international narcotics networks requires adequate forensic technology support.

Based on the background description, the research questions are as follows:

1. How is law enforcement related to narcotics crimes involving hydroponic marijuana cultivation in the jurisdiction of the Bali Regional Police?
2. What obstacles do investigators face in the detection, search, seizure, and evidence-based investigation of hydroponic marijuana cultivation in densely populated residential areas?

Research methods

This research is an empirical legal research that examines the effectiveness of law enforcement practices in drug crime. The approaches used include a statute approach, a conceptual approach, and a case approach.

Primary data was obtained through interviews with investigators from the Bali Regional Police Narcotics Investigation Directorate, while secondary data was obtained through a literature review of laws and regulations, legal books, scientific journals, court decisions, and other relevant literature. All data was analyzed qualitatively using descriptive analytical methods to provide an overview of the effectiveness of law enforcement regarding hydroponic marijuana cultivation within the Bali Regional Police jurisdiction.

RESULTS AND DISCUSSION

Law Enforcement Against the Modus Operandi of Hydroponic Marijuana Cultivation in the Bali Police Jurisdiction

Law enforcement is the process of realizing legal norms through the actions of law enforcement officials aimed at creating legal certainty, justice, and public benefit. In the context of narcotics crimes, law enforcement is not only directed at eradicating perpetrators but also at disrupting drug trafficking networks. Advances in modern agricultural technology have been exploited by narcotics criminals to cultivate marijuana using hydroponic systems. Unlike conventional methods, hydroponic systems allow marijuana plants to grow indoors using a soil-free growing medium combined with artificial lighting (grow lights), humidity control, air conditioning, automatic irrigation systems, liquid fertilizers, and CCTV surveillance.

This modus operandi offers various advantages to perpetrators, including accelerated harvest times, improved crop quality, reduced risk of detection, and the possibility of cultivation in densely populated urban areas. In a case successfully uncovered by the Bali Regional Police Narcotics Investigation Directorate, investigators discovered a residence that had been modified into a hydroponic marijuana cultivation laboratory complete with various modern facilities. Based on the results of the investigation, it was discovered that the entire

process of seeding, maintenance, and plant growth was carried out systematically using legal agricultural technology so that from outside the building it did not arouse public suspicion.

Based on the provisions of Article 111 paragraph (2) of Law Number 35 of 2009 concerning Narcotics, any person who without the right to plant, maintain, possess, store, control, or provide narcotics class I in the form of plants with a weight exceeding the provisions can be punished with life imprisonment or imprisonment of a minimum of five years and a maximum of twenty years with a fine. In practice, law enforcement is carried out through several stages.

1. The first stage is the investigation, which involves gathering information regarding the alleged crime. Investigators utilize public information, surveillance techniques, cyber patrols, financial transaction analysis, and coordination with the National Narcotics Agency and related agencies.
2. The second stage is the investigation, which is conducted after sufficient preliminary evidence has been found. At this stage, investigators conduct searches in accordance with the provisions of the Criminal Procedure Code, seize evidence, conduct forensic laboratory examinations of the marijuana plants, interview witnesses, and interrogate the suspect.
3. The third stage is the verification stage, which involves proving that the plants found are indeed marijuana and proving the perpetrator's intentional cultivation of Class I narcotics..

In hydroponic marijuana cultivation cases, evidence relies not only on plant evidence but also on various other evidence, including CCTV footage, hydroponic equipment, ultraviolet lamps, air conditioning systems, seed purchase records, electronic transactions, digital communications, and forensic laboratory results. According to Soerjono Soekanto, successful law enforcement is influenced by five factors: the law, law enforcement officers, infrastructure, the community, and legal culture. All of these factors are interconnected in determining the success of eradicating narcotics crimes using modern technology.

Technological advancements require law enforcement officials to enhance their digital forensic investigative capacity. Investigators must not only understand conventional investigative techniques but also master information technology, electronic device analysis, and hydroponic cultivation systems to uncover the full range of crimes. In addition, the success of law enforcement is also determined by coordination between the Police, the National Narcotics Agency, the Forensic Laboratory, the Prosecutor's Office, the Courts, the Directorate General of Immigration, and other agencies, considering that the perpetrators are often part of

an international narcotics network, as found in the case of hydroponic marijuana cultivation involving foreign nationals in Bali.

Obstacles faced by investigators in the process of detecting, searching, seizing, and proving the crime of hydroponic marijuana cultivation in densely populated residential areas

Law enforcement against narcotics crimes is determined not only by the completeness of regulations, but also by the ability of law enforcement officials to anticipate evolving criminal modus operandi. Advances in modern agricultural technology have shifted marijuana cultivation patterns from conventional systems to indoor hydroponic cultivation. This change presents new challenges for investigators, as almost all cultivation activities are conducted indoors, utilizing technology that is legally recognized as agricultural equipment. This situation makes the detection and evidence-gathering process far more complex than uncovering conventional marijuana plantations.

From the perspective of Soerjono Soekanto's law enforcement theory, the effectiveness of law enforcement is influenced by five factors: the law, law enforcement officials, facilities and infrastructure, the community, and legal culture. These five factors are interrelated in determining the success of uncovering narcotics crimes involving hydroponic marijuana cultivation.

Obstacles in the Early Detection Process

The initial stage that determines the success of uncovering hydroponic marijuana cultivation cases is early detection. Unlike marijuana gardens grown in open areas, hydroponic cultivation is carried out inside homes, shophouses, warehouses, villas, or other buildings that are tightly enclosed, creating virtually no visual indication from the outside. Perpetrators generally use special rooms equipped with air conditioning, grow lights, automatic ventilation, humidity control, drip irrigation systems, plant nutrient levels, and 24-hour closed-circuit television (CCTV) cameras. This technology allows plants to grow optimally without requiring direct sunlight. Furthermore, perpetrators typically choose cultivation locations in densely populated residential areas. This strategy aims to reduce suspicion by authorities because the movement of people entering and leaving the house is perceived as normal community activity. In some cases, the houses used are rented under the names of other parties, making it difficult to immediately identify the perpetrators.

According to research, the Bali Regional Police Narcotics Investigation Directorate's success in uncovering hydroponic marijuana cultivation cases stems more from intelligence information and public reports than from routine patrols. This demonstrates that public

participation remains a crucial factor in the successful early detection of drug crimes. However, the public is often reluctant to provide information due to concerns about their own safety and that of their families if the reporter's identity is discovered by the perpetrator's network. This situation requires investigators to spend relatively longer to obtain sufficient preliminary evidence before taking legal action.

Obstacles in Carrying Out Searches

Searches are one of the most crucial investigative steps in hydroponic marijuana cultivation cases because almost all evidence is contained within a closed building. According to the Criminal Procedure Code, searches must be conducted with a warrant from the Chief Justice of the District Court, except in extremely urgent circumstances as stipulated by law. This provision protects citizens' privacy rights and ensures that investigators' actions remain within the law. In practice, investigators face various obstacles when conducting searches. One such obstacle is the possibility that the perpetrators have monitored the presence of officers through surveillance cameras installed in various parts of the building. It is not uncommon for perpetrators to attempt to destroy evidence by turning off the hydroponic system, destroying plants, or deleting electronic data before investigators can enter the premises.

Furthermore, houses used for cultivation often have multi-layered security systems such as automatic gates, electronic doors (smart locks), and biometric access, making it more time-consuming for investigators to enter the premises. This situation demonstrates that technological advancements are not only exploited by law enforcement officials but also by criminals to hinder the investigation process.

Obstacles in Confiscation of Evidence

Evidence in hydroponic marijuana cultivation cases includes not only the marijuana plants, but also all the equipment used to cultivate them. This evidence includes, among other things:

1. Marijuana seeds;
 2. Hydroponic growing medium;
 3. Liquid fertilizer;
 4. Grow lights;
 5. Air conditioners;
 6. Humidity regulators;
 7. Water pumps;
 8. Nutrient regulators;
 9. Digital scales;
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10. Cell phones;
11. Computers;
12. CCTV cameras;
13. Digital recordings;
14. Bank accounts;
15. Cryptocurrency wallets;
16. Electronic transaction documents.

The large number of types of evidence means that investigators must coordinate with various experts, including forensic laboratory experts, digital forensic experts, information technology experts, and botanists to ensure that all evidence is related to the alleged crime. Another problem is the confiscation of electronic data stored in cloud storage systems. This data is often located on servers abroad, so it requires international cooperation mechanisms to gain access to this digital information.

Obstacles in Proof

The evidentiary stage is the most crucial stage in the law enforcement process. Investigators must be able to prove that the suspect intentionally planted, maintained, controlled, or supplied Class I narcotics, as stipulated in Article 111 of Law Number 35 of 2009 concerning Narcotics. In cases of hydroponic marijuana cultivation, proof is not sufficient merely to demonstrate the presence of marijuana plants. Investigators must also prove a legal relationship between the suspect and the cultivation site, ownership of the hydroponic equipment, the origin of the marijuana seeds, the purpose of the cultivation, and the perpetrator's involvement in a narcotics distribution network.

The difficulty of providing evidence increases if the cultivation site is a rented house, a rented villa, or a building under the identity of another party. In such circumstances, investigators must gather additional evidence in the form of electronic communications, financial transactions, CCTV footage, witness statements, and forensic laboratory results. According to the theory of evidence in Indonesian criminal procedure law, a judge can only impose a sentence if they reach a conviction based on at least two valid pieces of evidence, as stipulated in Article 183 of the Criminal Procedure Code. Therefore, investigators are required to construct a comprehensive evidentiary structure so that all elements of the crime can be convincingly proven in court. In addition to proving the elements of the crime, investigators must also establish the perpetrator's connection to a broader narcotics network. This is crucial because hydroponic marijuana cultivation is generally not conducted for personal consumption, but rather as part of an organized narcotics distribution chain.

Constraints on Facilities, Infrastructure, and Human Resources

The development of hydroponic cultivation technology requires law enforcement officers to possess competencies that align with evolving crime trends. Investigators are no longer limited to understanding conventional investigative techniques; they must also master information technology, digital forensics, electronic transaction analysis, and modern agricultural technology. The limited number of investigators with multidisciplinary expertise is a significant obstacle to handling technology-based narcotics cases. Furthermore, the procurement of modern detection equipment, digital forensic devices, and laboratories capable of rapidly identifying narcotics plants still requires adequate budgetary support.

Therefore, increasing human resource capacity through education, training, certification of digital forensic investigators, and collaboration with research institutions and universities is an unavoidable necessity in addressing the evolving modus operandi of narcotics crimes. Based on this description, it is clear that the obstacles to law enforcement regarding hydroponic cannabis cultivation stem not only from legal aspects but also from technological developments, limited supporting facilities, the complexity of evidence, and the characteristics of increasingly organized narcotics crime networks. Therefore, strengthening regulations must be accompanied by increasing institutional capacity, utilizing modern investigative technology, and strengthening synergy between the Police, the National Narcotics Agency, the Forensic Laboratory, the Prosecutor's Office, Immigration, the Financial Transaction Reports and Analysis Center (PPATK), and the community in order to realize effective law enforcement.

CLOSING **Conclusion**

Based on the results of research and discussion regarding law enforcement against the modus operandi of hydroponic marijuana cultivation in densely populated residential areas within the jurisdiction of the Bali Regional Police, the following conclusions can be drawn.

1. First, law enforcement against hydroponic marijuana cultivation crimes within the jurisdiction of the Bali Regional Police has been carried out in accordance with Law Number 35 of 2009 concerning Narcotics, the Criminal Procedure Code, Law Number 2 of 2002 concerning the Indonesian National Police, and various other implementing regulations. Law enforcement is carried out through stages of inquiry, investigation, search, seizure, forensic laboratory examination, and the transfer of cases to the public prosecutor. In practice, the Bali Regional Police Narcotics Investigation Directorate has been able to uncover cases of hydroponic marijuana cultivation using modern

technology such as hydroponic systems, room temperature control, artificial lighting, automatic irrigation systems, and CCTV cameras. This success demonstrates that law enforcement officials have been able to adapt their investigative methods to the increasingly complex *modus operandi* of narcotics crimes.

2. Second, the effectiveness of law enforcement still faces various obstacles, both legal and technical. These obstacles include the difficulty of detecting cultivation locations conducted within closed buildings, the use of modern technology that disguises cultivation activities, limited facilities and infrastructure for technology-based investigations, the complexity of proving electronic evidence, limited human resources with digital forensic competencies, and the still low level of public participation in providing information to law enforcement officials. Furthermore, the transnational nature of narcotics networks means that the investigation process requires cross-agency coordination and even international cooperation. Therefore, the success of law enforcement depends not only on the quality of regulations, but also on the professionalism of officers, technological support, inter-institutional synergy, and active public participation.

Suggestion

Based on the results of this research, the author provides several suggestions as follows.

1. First, the Government of the Republic of Indonesia, particularly lawmakers, must continue to update regulations in the field of eradicating narcotics crimes by accommodating developments in digital technology used as a means of committing crimes. Regulations regarding electronic evidence, digital data seizure, the use of artificial intelligence (AI), and investigative mechanisms for technology-based cultivation systems need to be strengthened to provide legal certainty for law enforcement officers.
2. Second, the Indonesian National Police, particularly the Bali Regional Police Narcotics Investigation Directorate, must improve the capacity of investigators through ongoing education and training in digital forensics, cyber investigation, hydroponic technology, financial transaction analysis, cryptocurrency investigation, and the use of artificial intelligence in the investigation and prosecution of narcotics crimes. Furthermore, it is necessary to modernize investigative tools such as digital forensic equipment, thermal cameras, drone surveillance, and big data-based data analysis systems to support effective law enforcement.

3. Third, the National Narcotics Agency, local governments, educational institutions, community leaders, and community organizations should improve legal education programs regarding the dangers of drug abuse and increase public participation in providing information about suspicious activity in their neighborhoods. Protection for whistleblowers also needs to be strengthened so that the public feels safe in assisting law enforcement officials in uncovering drug crimes

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