

“Cannabis production in Belgium: assessment of the nature and harms, and implications for priority setting” (CANMARKT)

SUMMARY

1 RESEARCH OBJECTIVES

Over the last three decades major changes on the supply side of cannabis have occurred. Numerous countries around the world have switched from importing foreign cannabis to locally producing their own supplies. In Belgium too, domestic cultivation has boomed, at the expense of bulk-imported cannabis. Gradually smaller quantities of cannabis are being intercepted at the national borders, and the number of plantations that have been dismantled by the authorities has increased sharply in recent years.

These changes in the organization of the cannabis market raise important questions for drug researchers and policy makers, for instance in terms of estimating the size of the domestic cultivation industry or in terms of opportunities for new and existing offenders to enter the illegal trade. Moreover, the rise of domestic or regional cannabis cultivation has been associated with heightened levels of criminal organization, involvement of ‘gangs’ and higher levels of violence.

As a consequence, several Belgian strategic action plans made the war against commercially and locally produced cannabis one of their respective law enforcement agencies’ priorities (e.g. the National Security Plan 2008-2011, the Action Plan of the College of Five Attorneys-General and the Federal Prosecutor’s Office). However, every effort or activity to reduce the cannabis supply should be informed by a sound empirical analysis and assessment of the phenomenon.

This study aimed to map different segments of cannabis production in Belgium and to investigate the harms to Belgium that this activity generates. In particular, we pursued the following five objectives:

1. to describe the **organization of cannabis production** in Belgium, which serves to map cannabis production as it currently occurs in Belgium;
2. to create typologies of different types of cannabis producers in Belgium, based on their *modi operandi* and aims;

3. to assess the **market significance of different types of cannabis** producers in Belgium (i.e. market segments);
4. to estimate the harms associated with the *modi operandi* of different types of producers;
5. and to evaluate the impact of the Belgian drug policy strategies on them, including their unintended consequences.

2 DATA COLLECTION METHODS AND HARM ASSESSMENT FRAMEWORK

2.1 Mixed methods: web survey, analysis of criminal proceedings and interviews

In order to meet these objectives we used three data collection methods. The first one consists of an anonymous web survey among Flemish and Walloon cannabis growers and was conducted by the research team at the University of Ghent. This method generated 1,293 useful questionnaires, filled in mainly by people who have experience growing cannabis on 'micro' (2-5 plants) and 'mini scale' (6-49 plants) (referring to the taxonomy used by the Belgian Federal Police, Centrale Dienst Drugs, 2013). The research team at the University of Leuven analysed 34 closed criminal proceedings and interviewed 20 imprisoned cannabis producers and 32 experts, primarily but not exclusively belonging to law enforcement agencies. The cases selected by the research team at the University of Leuven mainly concerned larger-scale growers. To refer again to the Belgian Federal Police's taxonomy, these data primarily concern 'small-scale' (50-249 plants), 'medium-scale' (250-499), 'large-scale' (500-999) and 'industrial-scale' (>1,000 plants) growing operations.

2.2 Harm assessment framework of cannabis production

The data sets described above are partly used to apply the harm assessment framework to cannabis production in Belgium. This framework can be considered as an instrument that enables us to identify and evaluate the harms associated with cannabis cultivation. The model builds on literature on drug-related harms, criminal harms, and national security. It consists of a set of tools and a multistep process with which to apply them; specifically, it draws together a model of the criminal activity, which we refer to as a 'business model', a taxonomy of the types and bearers of harms, scales for evaluating the severity and incidence of harms, and a matrix for prioritizing harms. This business model depicts the typical *modus operandi* of a criminal activity and provides an evidentiary base for identifying possible

harms, evaluating their severity and incidence, prioritizing them, and establishing their causality.

We began by constructing a business model, defined loosely as the *modus operandi* for cannabis production. The business model provided essential building blocks of information. We used it to characterize the key operational phases of the activity and describe the functions and modes of accompanying and enabled activities.

Having constructed the business model, we:

- Identified the possible harms associated with cannabis cultivation, and the bearers of those harms; this step involved sorting harms by primary, accompanying, and enabled activities and classifying harms according to type and bearer with the taxonomy.
- Evaluated the severity and incidence of harms; this step involved rating the severity and overall incidence of each harm with the ordinal scales. The overall incidence accounts for the incidence of each harm in relation to the criminal activity (the 'within-activity' incidence) and the incidence of the criminal activity itself. A criminal activity might always produce serious harm but if the activity is very rare, it might not merit concern.
- Prioritized harms, using the matrix.

We also attempted to establish the *causes* of harms. Although we have not developed a specific tool for this step, we proceeded in two stages. First, we assessed the 'distance' between the harms and the primary activity. The harms of enabled activities, for example, constitute 'remote harms' (Ryberg, 2004: 64-65), because they are not just spatially-temporally distant but are mediated by the choices of other actors along the supply chain. Second, we examined the extent to which the harms associated with a criminal activity arise from the policy environment, including the prohibition of the activity and related regulations and enforcement practices. We carried out this assessment on the basis of counterfactual reasoning, a common test in the social sciences and in historical studies: we considered what might have happened had the policy not been in place—in this case, had cannabis production not been prohibited. The purpose of this exercise was to assess the extent to which harms are intrinsic to an activity or an artefact of policy and, thus, to identify arenas in which policy-makers might have substantial leverage to effect change.

3 RESULTS

Thanks to the different methodologies we covered a wide range of growers. However, the specific methodologies lead to a selection bias, and we are aware of the problem of socially desirable responses both in the survey and in qualitative interviews with imprisoned growers. Therefore, we cannot generalize our findings to the whole Belgian cannabis market.

Despite these unavoidable limitations, we have fully met objectives 1, 4 and 5 of the study and partially met objectives 2 and 3. Contrary to what was foreseen by objective 2, we did not create a new typology of cannabis producers. Our intention was to build such a typology on the basis of the harms generated by the growers, and our data did not fully support such a typology. However, as shown below, we prove that harms are not distributed uniformly across the whole spectrum of growers and provide supporting evidence for existing typologies based on growers' motivation and modus operandi (eg., Weisheit, 1991, 1992; Hafley & Tewksbury, 1996; Hough et al., 2003; Potter & Dann, 2005; Potter, 2010a; Nguyen & Bouchard, 2010). With reference to objective 3, we provided a tentative assessment about the market significance of the different types of cannabis producers. However, due to data limitations, we could not develop a full-fledged estimation.

Our data provide information on growers' motivations and careers (chapter IV), their sources of information (chapter V) and the business model of cannabis cultivation (chapter VI and VII). Together with a discussion of the accompanying activities of cannabis cultivation (chapter VIII) this resulted in a harm assessment of cannabis cultivation. Based on these results, harms of cannabis cultivation were assessed (chapter IX) and unintended consequences of current policy measures were evaluated (chapter X). These findings lead to a range of policy, operational and research recommendations which are discussed in section 4 of this summary.

3.1 Growers' motivations and 'careers'

The survey respondents report that they are mainly motivated by the pleasure of growing, their personal consumption and the wish to share their home-grown cannabis with their friends and family. Most of them are frequent cannabis consumers and started growing cannabis between the ages of 18 and 25, and grow cannabis currently or have done so in the last 12 months. Only a small proportion (7.9%, n=84) indicate that they have ever come into contact with the police because of cultivation, and of that group not even a fifth (18.1%, n=15) was also convicted for this activity. The information we have of growers we interviewed or who were indicted in criminal proceedings gives a rather different picture. As expected,

they grow mainly for profit, but for some of them, the initial motivations changed along the way: from personal consumption to a more commercial orientation. Although some interviewed growers started cultivation for personal consumption, not much is known about their current consumption patterns, and some do not consume cannabis at all.

The estimated risk of being caught by the police is considered to be low or very low by the survey respondents, although the fear of getting caught is considered an important disadvantage of growing. For interviewed growers the fear of getting caught does not seem to be an important reason to quit or not to start again after release.

3.2 Sources of information and help and patterns of cooperation

All sources show that the internet has become an important source of information for persons who want to start growing cannabis, whereas this information was in the past only available in books and magazines. However, face-to-face contacts with other growers, and help and advice of persons in one's own social network are still very important. Our sources indicate it is possible to conduct the process of cultivation and sale alone, or with limited help. But especially on a larger scale, it is harder to operate alone, and it is more likely that specific tasks are delegated and that more people are involved.

Information on the types of organizations generally confirms earlier research on cannabis cultivation in the Netherlands. The majority of the survey respondents report that they work alone (66.3%, n=845) or with one other person (21.4%, n=273). However, also 'solo workers' might still be part of a larger network, but the extent of these networks could not be identified based on our sources; the internet survey is not suitable to grasp such a broader scope, and the criminal justice sources are restricted to the investigated suspects and often did not lead to mapping a complete organization, especially when certain suspects resided in the Netherlands. Law enforcement mainly observes caretakers and cutters who are present at plantations at time of arrest, whereas these suspects in many cases have superiors (in the Netherlands), who often successfully stay out of view of law enforcement. Therefore it is possible that certain individuals, networks and collaborations in cannabis cultivation lead to the same few top-level actors. Further research is needed to construct a more complete picture of the share of certain growers and their collaborations in the cannabis market.

3.3 Business model of cannabis cultivation

In developing the business model of cannabis cultivation we distinguish three main phases of cannabis cultivation, namely the acquisition of material, the growing process and harvesting.

Starting with the first two phases, we conclude that almost all interviewees and suspects of criminal proceedings obtain their growing material from Dutch growshops.

We did not identify any harms in the phase of acquisition of materials, but we did identify harms related to the growing process. Overall the most important harm during the process of growing cannabis, is **theft of electricity**, which is ultimately paid for by all users of electricity in Belgium and subsequently the **fire damage** caused by the illicit manipulation of the electricity meter. Odour nuisance is the most indicated nuisance in the survey. But the majority of the survey respondents (75.3%, n=854) indicate that they have never experienced other damages or nuisance related to their cultivation activities.

Because installing larger-scale plantations requires adjusting (possibly damaging) the interior of a building to fit the needs of the material, damages are more common based on other sources than reported by the survey respondents (mainly 'micro-' and 'mini-scale' growers). In some criminal proceedings, reports were found on the **damage to the interior or structure of the building** such as holes in the floor, ceiling and walls. Another source of harm during the process of growing reported by interviewees and in the criminal proceedings is **the use of false identity cards** for renting locations that were used for cannabis cultivation.

Although we have information about the scale of cannabis cultivation of the growers in our sources, this is not sufficient to assess the market significance of different types of cannabis producers in Belgium. The scales of cannabis cultivation in our sources are to a large degree related to the selection biases of our sources, and we cannot give an estimation of the size of the Belgian cannabis market as a whole. But at least the response on the internet survey both in 2007 (a total of 659 growers) and in 2013 (response of 1,293 growers) shows that there are a significant amount of growers in Belgium who grow on a relatively small scale (2013: 83.1%, n=917 grow a maximum of 10 plants). Still, this is an underestimation, as not all individuals growing cannabis in Belgium have participated in the survey.

Whereas the interviewees cultivating cannabis on a large scale sell almost their entire yield (in the Netherlands), an overwhelming majority (82.1%) of the internet survey respondents did not sell any cannabis, but rather gave away part of the cannabis, or used it for personal consumption. The majority of the survey respondents (67%) obtained yields of less than 50 grams per plant, and the tentative calculations based on the interviewees and criminal proceedings about yields are quite similar.

We identified one source of harms during the process of harvesting, namely **the use of cutting teams that might entail exploitation**. The prevalence of these, often female, cutting-teams merits further research due to the possible vulnerable position of members of these cutting-teams.

In most of the criminal proceedings and for almost all interviewees, the large-scale harvests are destined for the Dutch market. For the survey respondents who sold harvest, they mainly did so (partly) to friends, acquaintances and family. It can therefore be assumed that the cannabis they produced is consumed in Belgium and not exported.

3.4 The accompanying activities of cannabis cultivation

The accompanying activities that we identified are theft or vandalism at plantations, the use and threat of violence, corruption (both by officials and private-sector entities) and money laundering. The harms most frequently experienced by growers are the **theft of plants, harvest or equipment and the destruction of plants**. This accompanying activity only leads to harms to illegal entrepreneurs, and we therefore do not consider it as a harm according to the harm assessment model. However, it does turn out to be an important reason for threats and use of violence.

Our sources indicate that the **actual use of violence** in the context of cannabis cultivation occurs rarely, whereas **threats of violence** are reported more frequently. Apart from theft of plants or harvest, another important reason for these conflicts is disagreement about money. An interesting finding is that among the survey respondents who grow for profit, a higher proportion experienced threats and use of violence and physical consequences of violence, than those claiming to grow for other reasons (either as an offender or victim). This seems to be in line with the finding that financial matters are an important reason for conflicts: in that sense, people who do not grow for profit are then not very likely to end up in such conflicts.

The little information we found on **corruption** provides more evidence of the involvement of the private sector facilitating cannabis cultivation than of government officials. Only a few sources report police or court employees who provide help or advice to cannabis growers. More often, facilitation of electricians and (employees in) the cannabis industry (e.g. growshops and coffeeshops) are observed. Experience, scale and motivation of growing are associated with facilitation and corruption: among the survey respondents who typically grow more than five plants or are more experienced, there is a larger share that search for professional advice and help outside of their direct social environment, than among those who grow on a smaller scale or have less experience. Also, among the 'commercial growers' a higher proportion rely on practical help of professionals (both within and outside of the cannabis market) than among those who report not to grow for profit.

Whereas the financial profits are found to be the most important motivation for growers, not much is known about the destination of these profits. From what is known, many proceeds end up in paying for living expenses, luxury goods and investments in new

cultivation activities. In some of our sources rather sophisticated **money laundering** methods are observed, but these do not seem to cause any clear harm. We hardly found evidence that cannabis growers have been able to infiltrate or affect any sector of the Belgian legitimate economy, even locally. However, the continuous cannabis cultivation activities and the spending of their financial profits (even if only for luxury goods) send the message to growers and to people in their environment that crime pays. Moreover, the involvement of financial facilitators (e.g. lawyers, bank employees), who provide advice and help to effectively invest and launder money from cannabis cultivation, affects their organizations' integrity and reputation.

3.5 The harms of cannabis cultivation and its accompanying activities

To assess the harms of cannabis cultivation and its accompanying activities, we applied the harm assessment model to cannabis cultivation, integrating all the harms of the phases of cannabis cultivation and its accompanying activities.

The application of the harm assessment framework indicates that, absent an evaluation of use-related harms, cannabis cultivation generates a small set of notable harms to individuals and institutions. Recalling the sharp increase in the number of detected plantations and the number of discovered plants in Belgium since 2003, we describe cultivation as an activity that occurs 'always'. The most serious harms that are given at least a medium-low priority will be summarized here. We did not identify harms to the environment that can be given more than low priority.

For **individuals** the most notable harms occur to their functional integrity, namely the loss of life in the case of lethal violence; a catastrophic harm that occurs only rarely and is therefore given medium/high priority. Other harms that are given medium, or medium/low priority are harms caused by the growing process to the material interest of individuals, in case rented properties are damaged (e.g. holes in walls, waterflow) or seriously damaged (e.g. fire) by the cultivation activities.

The harms to property also occur to **private-sector entities**; similarly as to individuals their property can be damaged, or seriously damaged by cultivation activities, harming their material interest if properties are rented for cultivation without their consent. These harms are also rated for incidence similarly as they are for individuals, because based on our sources we cannot conclude how often property owners are either individuals or private-sector entities.

For the Belgian **government**, two harms are given medium priority. First, dismantling operations harm the governments' material interest because of the direct costs. This is considered a marginal harm that occurs persistently. Second, the reputation of the

government is harmed as it appears unable to enforce its laws on cannabis cultivation and related corruption, and appears unable to protect its citizens from the use and threat of violence. Moreover, the earnings of cannabis cultivation that are invested in luxurious lifestyles suggest that crime pays, thus also tainting the government's reputation. This is considered a marginal harm, but as it always occurs when law-breaking leaves the impression that a government lacks authority and given that cannabis cultivation in Belgium occurs always, it is given also a medium priority.

Our analysis indicates that harms of cannabis cultivation and its accompanying activities are not spread uniformly among growers; some of them are over-proportionally responsible for some harm. We also found differences among the survey respondents according to scale, experience and motivation of growing.

These findings do point in the direction of the 'most harm-causing' type of grower, but hard conclusions cannot be made. However, we can at least conclude first that cannabis cultivation produces relatively little harm, and second that the most serious harm occurs to individuals who participate some way or another in cannabis cultivation themselves. And third, that at least growers who grow less than 20 plants, and especially those growing between 1-5 plants (the majority of the survey respondents) hardly produce harms during the process of growing.

3.6 The current policy and its unintended consequences

The increased number of plantations being discovered in the last decade and the increase of investigations of cannabis cultivation is partly the result of the increased focus on the phenomenon by the priority set in the National Security Plan of 2008 (Nationaal veiligheidsplan, 2008-2011). This prioritization was partly motivated by the large sums of money generated by cannabis cultivation and assumed involvement of organized crime. The focus on cannabis cultivation in that period led to an increase in the plantations discovered in Belgium, but there is no evidence it has disturbed the cannabis market or that it reduced the supply. Police interventions do not necessarily have a deterrence effect if we look at the recidivism of suspects in the analysed proceedings and by interviewed growers. Most of the time, the individuals who are present at plantations at time of the intervention are prosecuted, but these are often not those who carry full responsibility for plantations and the related harms. And although relatively high sentences are imposed, these sentences are often not served.

The harms that we assessed largely arise from the illegal status of cannabis and from regulations and law enforcement practices around that status. These can therefore be considered as unintended consequences of the current policy. But without an overall

assessment of all harms, including those generated by cannabis use, we cannot give a final appraisal: it might be that the harms of cannabis cultivation that we assessed are offset by the use-related harms prevented by prohibition, which we cannot determine based on our study.

Another problem of the current policy is that it prescribes prosecution of all growers, regardless of the harm they produce and therefore including relatively ‘harmless’ smaller-scale growers and thus ends up favoring the most harmful growers, and/or those related to organized crime, who ends up being —comparatively speaking— punished more mildly.

A further problem is that the current Belgian policy on cannabis cultivation is not uniformly implemented across different judicial districts. Policy implementation depends on how cannabis cultivation displays itself per district, on the staff capacity of local police and justice departments, and on local decisions on priorities. In some districts projects are set up to sensitize law enforcement officers and other institutions (e.g. electrical companies) to make them more aware of signs of cannabis cultivation and to exchange information. But such cooperation and exchange of information, even between different law enforcement institutions, are not standard. These differences in implementation, if spotted by the large-scale growers, might also generate incentives for them to move from one district to the other.

The troublesome way of cooperation with foreign, especially Dutch, authorities in investigations restricts the possibility to map the full organization behind cannabis cultivation. As cannabis cultivation is a local activity that is part of a highly transnational market, this causes serious limitations of local and national policies and interventions.

4 GENERAL, OPERATIONAL AND RESEARCH RECOMMENDATIONS

Based on our findings, we have developed the following policy recommendations:

4.1 General recommendations

As a large body of literature shows (e.g., Paoli, Greenfield & Reuter, 2009), reducing the supply of cannabis or of any illegal drugs is not a realistic objective in a country such as Belgium that occupies a central position in Western Europe and no longer has border controls with most of its neighbors. As long as this demand persists, Belgian law enforcement are unlikely to achieve more than the famous “balloon effect” (e.g., Greenfield and Paoli, 2012), thus shifting cannabis production either to other Belgian provinces, if for example, the emphasis is concentrated in the provinces bordering the Netherlands, or, if the enforcement in Belgium were to become uniformly very tough, to other countries. **Belgian**

drug policy-makers should thus accept the fact that their policies can have only a limited impact on the cannabis production in Belgium, as this primarily reacts to incentives created outside the Belgian borders. Policy should thus aim at reducing the harms associated with cannabis production (and cannabis consumption) rather than trying to reduce consumption via the reduction of the supply.

Our study demonstrates that cannabis cultivation generates limited harms for Belgium. On the basis of Greenfield and Paoli (2013)'s harm assessment framework, the vast majority of the harms identified for Belgium deserve only medium-low or medium priority. This finding in principle means that **cannabis production should no longer be considered as a priority** in the National Security Plan as it instead has in the last two such Plans (Nationaal Veiligheidsplan 2008-2011 and 2012-2015).

Our study also shows that most of the harms associated with cannabis cultivation are the result of the current criminalizing policies. As we did not identify or assess the harms associated with drug use, we do not know if on balance the harms prevented on the demand side via the criminalization and the resulting discouragement of cannabis use are higher or lower than the harms generated by restrictive policies on the supply-side of the market. Pending such an empirical assessment, policy-makers should at least be aware of the fact that most of the harms associated with cannabis cultivation are the result of current policy choices and they should be **committed to reduce such harms** at a minimum. Further depenalization of cannabis consumption and cultivation for personal use should be seriously pondered and even the full decriminalization and regulation of cannabis cultivation should be considered as a serious policy option. This option is recently receiving more and more support on a global level (Count the costs, 2012; Global Commission on Drug Policy, 2011; Transform Drug Policy Foundation, 2009) and is now being implemented in two US States, Colorado (see www.mpp.org, the Marihuana Policy Project) and Washington (see e.g. Washington State Liquor Control Board, 2013), and in Uruguay (Murdocco, 2013; Chokshi, 2013; Meyer, 2013).

As the harms are not uniformly spread across the different types of growers, policy should target the growers or market segments that are responsible for an over-proportional share of the harms. In particular, growers cultivating up to 5 plants (the majority of our survey respondents) seem to generate hardly or no harm and can even be regarded as generating 'benefits' as they subtract market shares to larger-scale growers, who are more likely to be involved in organized crime. Most Belgian judicial districts grant low priority to small-scale growers, even though according to current legislation and policy guidelines only the

cultivation of one female plant is formally tolerated.¹ Rightly the police forces and prosecutor's offices of most judicial districts tend to focus their limited resources on larger-scale growers. However, as the law enforcement officers and prosecutors admit, considerable differences remain across districts depending on the resources available, the (perceived or observed) frequency of cannabis cultivation and the preferences of individual prosecutors. The latter, if they want, can still prosecute anybody found to cultivate two plants of cannabis for their own consumption, and even if a thorough analysis of prosecutorial and sentencing strategies was beyond the scope of the current project, people only growing a few plants are indeed also prosecuted sometimes. A change of the drug law, so as to raise the amount of plants allowed for personal consumption, or at least the adoption of nationwide prosecutorial guidelines could reduce arbitrariness and increase the uniformity of the current policy. Together with a drug network of attorneys, the Belgian Attorney General already collects information on local experiences. At the very least, if no change of the law or official guidelines are feasible, the Attorney General should do his utmost to publicize and promote best practices to promote the implementation of a more uniform and effective drug policy in the whole country.

4.2 Operational recommendations

During the selection of proceedings and the expert interviews we observed at least a few times that police officers' and prosecutor's offices of different judicial districts carry out investigations into the same suspect but do not always combine or exchange evidence on them. This is obviously a missed opportunity to map the extent of cannabis production and the full range of activities of specific criminal organizations. Therefore we recommend the establishment of a more structural way of information exchange between police forces and prosecutor's offices of different judicial districts. Although some initiatives have been launched to tackle this deficit, some experts still regard these communication problems as very serious and hampering.

Circumstantial evidence of cannabis cultivation first becomes apparent to a variety of private entities, such as electricity companies and real estate agencies and owners, and some of these private entities also bear some of the most serious harms. Belgian law enforcement agencies should therefore strive to develop formal and effective cooperation agreements with these entities. A few police officers interviewed stated that they would like to

¹ The legal reference (in Dutch) is: Gemeenschappelijke richtlijn van 25 januari 2005 van de Minister van Justitie en het College van procureurs-generaal omtrent de vaststelling, registratie en vervolging van inbreuken inzake het bezit van cannabis, *Belgisch Staatsblad*, 31 januari 2005.

create a structural cooperation with electricity companies, as they need to be able to count on them when a cannabis plantation is discovered and because they help avoid electricity dangers. Electricity companies also have an interest in cooperating with police to reduce or claim back their financial losses, to develop a centralized databank of the damages they suffer because of cannabis cultivation and to improve the expertise of their staff. Belgian policy-makers should also consider whether they might want to introduce the administrative approach developed in the Netherlands to tackle the problem. However, analyses of the impact of the Dutch policy have shown little effects on the cannabis market as such (apart from balloon effects), and have pointed at unintended consequences: a commercialisation and bureaucratisation of the law enforcement strategies (Wouters, Korf en Kroeske, 2007; Wouters, 2008) and a 'hardening' of the cannabis industry (Maalsté & Panhuysen, 2007). It should be considered to cooperate also with other organizations to enable the police to gather more information about health risks during arrests and dismantling operations. For example to avoid harmful consequences of mould and pesticides for police officers.

Real estate owners and agents should also be made more aware of, and accountable for, the phenomenon of cannabis cultivation and related practices, such as the use of false identity cards by prospective growers. According to two interviewed imprisoned cultivators and three criminal proceedings, real estate agents and owners do not always check legal documents of prospective tenants. They are also not officially required to check prospective tenants' background and the plausibility of their motivation to rent a property. Belgian courts pay the costs of dismantling a cannabis plantation, once this is discovered by the police, so that the property owners ultimately suffer limited harms. In essence, this means real estate owners and agents are currently not motivated to prevent and detect cannabis cultivation. This policy ultimately creates incentives for real estate owners to become accomplices of cannabis growers or at the very least to turn a blind eye on the latter's activities. Policy-makers should consider promoting real estate owners' and agents' cooperation with law enforcement agencies by making the former co-responsible for cleaning up their property after a dismantling of a plantation.

Rather than merely trying to dismantle as many plantations as possible, law enforcement agencies should focus their resources and train their personnel to focus on large-scale growers who are likely to generate most and/or most serious harms, the networks these growers organize and on the seizure of the illegal revenues that these large-scale growing networks generate. These investigations are time- and resource-consuming and often have a high risk of failure and therefore many law enforcement officers consider them unattractive. However, unless networks are disrupted and the revenues of top-level offenders are identified, the dismantling of plantations and the arrest of a few growers are unlikely to have any long-term effect.

As the masterminds of cannabis cultivation often reside in The Netherlands, better international cooperation is needed to enable cross-border investigations.

Material of plantations that is seized during dismantling operations should in no districts be sold again by courts. Still in some districts the materials seized are sold by auction, leading to circulation of material by growers and tainting the government's reputation.

4.3 Research recommendations

Our study has collected many data on both small-scale and large-scale growers. It is not clear from the study if the 'mini-' or 'small-scale' -growers (i.e., those growing 20 to 50 plants) are simply underrepresented in the study or are instead rare in absolute terms, because current policies favour either small-scale growers cultivating cannabis to feed their own and their friends' consumption habits or larger-scale growers hoping to make real money with the cannabis they produce. We thus see a need for a study explicitly focusing on these middle-level growers.

In our sources we have repeatedly encountered vulnerable persons, who are in charge of the most risky tasks, such as caretaking of a large plantation, and who are in some cases manipulated to take or continue their jobs. As these people are most likely to be arrested and convicted, a future study should look at the sentences granted in the proceedings concerning cannabis cultivation to establish if current sentencing practices differentiate penalties to reflect the defendants' different roles and degree of responsibilities.

Ultimately, the value of a policy depends on whether the harms that it prevents are more or less serious, in their total incidence and severity than the harms that such a policy causes. Our study demonstrates that most harms associated with cannabis cultivation result from the current policy choices. As we did not identify or assess the harms associated with drug use, we do not know if on balance the harms prevented on the demand side via the criminalization and the resulting discouragement of cannabis use are higher or lower than the harms generated by restrictive policies on the supply-side of the market. Despite the serious methodological difficulties, a future study should aim to produce such a complex assessment. Along the same lines of the current study, it should first assess the harms associated with cannabis trafficking and retail dealing in Belgium. Then, by relying on the extensive medical and epidemiological literature, it should map and assess the harms associated with cannabis use and, in a third step, compare the harms of the supply-side, which are likely to be primarily generated by policies, with those prevented on the demand side through the criminalization of cannabis possession, trade and cultivation. Such a comparison will not be easy; however, it is the only way to systematically determine if the current policy is worth the investment or not. Lastly, a multidisciplinary team, also involving

epidemiologists, medical scientists and statisticians, in addition to the competences already represented in this project, could also develop scenarios to anticipate the expansion of cannabis consumption in the case of depenalization or decriminalization and thus the resulting growth of the harms associated with cannabis use and determine which policy scenarios are likely to produce the lower levels of total harms.