

Assessment of the log smuggling causes in Caspian forests, north of Iran

Mehrdad Nikooy*, Mohaddeseh Hajatnia, Bahman Sotoudeh Foumani, Elahe Mohammadi

Forestry Department, Faculty of Natural Resources, University of Guilan, Sowmeh Sara, 1144, Guilan, Iran

* Corresponding author's E-mail: nikooy@guilan.ac.ir

ABSTRACT

Undoubtedly, log smuggling is one of the most significant factors in quantitative and qualitative reduction of the Caspian forests in north of Iran, while it has received less attention in forest studies. This study was conducted to identify the causes of log smuggling in Guilan Province, Iran. A team of 24 experts from Forest Protection Department, Natural Resources and Watershed Management Organization, Guilan Province was selected, and the study was carried out in three phases by questionnaire and Delphi method. According to the frequency of responses to the first open-ended question in the first stage of Delphi method, number of 24 various specialists' ideas were identified as the causes of log smuggling. Greed of profiteers, unemployment and the need for income especially among young people, lack of planning in each forest area, poverty in forest communities, easy access to forest areas through forest roads, and closure of forestry plans had the highest frequency among responses. Based on the results from phase two of Delphi method, unemployment and the need for income especially among young people was the notable cause of log smuggling. Systematic corruption, greed of profiteers, poverty in forest communities, failure to deal effectively with log smuggling agents, buying and selling smuggled wood without any trouble are ranked second to sixth, respectively. The Kendall's W test showed no concordance between experts on the questions in relation to the comparison between the ranks among the variables. The results of the tests also showed that the "unemployment and the need for income especially among young people" factor was the first rank, while the "timber industry dependency on certain types of wood" was the last one. The summary of interviewee's opinions after the Kendall's W test illustrated that the most principle log smuggling causes are as follows: unemployment and the need for income especially among young people (94%), systematic corruption (89%), greed of profiteers (86%), and poverty in forest communities (84%), and failure to deal effectively with log smuggling agents (82%). By identifying the factors affecting log smuggling, the necessity of using a strategy to deal with these factors in Guilan Province is felt more than ever.

Keywords: Illegal logging, Forest law, Illegal timber trade, Forest dwellers, Questionnaire, Guilan Province.

Article type: Research Article.

INTRODUCTION

According to studies, various causes are reported as some causes of declining northern forests of Iran including the presence of livestock in the forest, increasing population growth rate, lack of clear and enforceable laws, land use change, lack of educational and extension activities, implementation of forest development projects and deforestation by forest dwellers (Rezvani & Hashemzadeh 2014). In addition, one of the most important causes of deforestation in these forests is log smuggling, which is actually illegal logging. However, the definition of log smuggling can vary depending on the type of timber harvesting (Miller *et al.* 2006). Overall, any illegal logging impairing the sustainable development of the forest can be considered as log smuggling, however, the same illegal logging can be done by legal permits, which can lead to illegal logging in the absence of proper supervision. In other words, any kind of logging happening illegally through violating the relevant laws and regulations can be called log smuggling (Callister 1999; Contreras-Hermosilla 2002). In developing countries, the people involved

in illegal logging are roughly divided into two groups: those who cut down trees for personal use and the ones cutting down them for income. In the first case, the illegal logging is rooted in the poverty of forest dweller communities. Wood is used for fuel, cooking and heating, and as a building material for housing and other rural buildings, whereas log is smuggled by wealthy and organized individuals in the latter one. The distinction between the two groups is critical, since they have completely different incentives and methods for illegal logging, hence, remedial measures to control illegal logging should be different as well. Based on the studies by United Nations Environment Program (UNEP) and the International Criminal Police Organization (ICPO), illegal logging activities generally include traditional methods of harvesting and use traditional tools like axes, saws and chainsaws to cut down trees, while the log smugglers generally do not select the proper cutting method for this work (Kumar & Agarwal 2016). Laws on forest protection, control of illegal logging and prevention of log smuggling are being severely weakened. Despite the evidence that illegal logging is on the rise in the Caspian forests, many illegal logging in the Iranian forests remains unknown and unreported. Generally, timber is extracted from the forest by an administrative and government permit, and any removal without a permit is considered log smuggling. The study of wood smuggling and its effective factors has been less studied in Iran and few studies in this field contain valuable information. Shoeibi *et al.* (2010) assessed the impact of wood import tariff on illegal wood logging in north of Caspian Forests reporting 1% change in tariff of raw wood. They also evaluated the volume of intermediate wood product which can cause 0.2% and 0.25% change in illegal wood logging, respectively. In addition, they pointed out that other variables like entrance barriers, as in the case of skinned log import, affected raw wood import and therefore had higher influence upon illegal wood logging. They also reported that reduction of raw wood tariff cannot be merely effective on illegal wood logging. In another study, Afrand *et al.* (2012) identified centers for wood smuggling violations and planning to prevent it. The results of their study showed that forest dwellers damage the forest by debranching, cutting and grazing livestock, and wood smuggling centers are generally located in the vicinity of forest villages.

Despite the systemic problems associated with log smuggling in the world, few studies have been conducted to explore the reasons underlying these practices. Alemagi & Kozak (2010) during their study about illegal logging in Cameroon, pointed out the effect of factors such as systemic corruption, poverty, conflicts, licensing schemes, usurpation of property rights, and inadequate institutional support in log smuggling. Richards *et al.* (2003) analyzed log smuggling in Honduras and Nicaragua, dealing with the issue of log smuggling in 5 sections. At first, while examining log smuggling, it was pointed out that as an illegal trade. Thereafter, while evaluating its economic, social and governing aspects, they mentioned the supervisory limitations in the discussion of log smuggling and the legal barriers to combat timber smuggling and finally outlined general policies on the subject under study. Karsenty (2003) addressed the root causes of the rapid spread of timber smuggling in tropical forests, including factors such as corruption, mismanagement, and faulty definition of property rights in the forest. Bouriaud (2005) worked on the illegal logging in the central and Eastern Europe and reported that rural poverty is the final cause of illegal logging in the study area. Ji *et al.* (2018) reported that corruption and decentralization in Indonesia have significant and positive impacts on the illegally-logged timber supply while excess demand in Japanese construction and furniture industries as well as Japan's housing starts are the significant factors that affect the illegal logging in Indonesia.

By ban on legal logging in the northern forest of Iran and the need of villagers, forest dwellers and industries for wood and wood products, it seems that the trend of log smuggling will change in the future. Employment is one of the most significant issues in human life manifesting differently in various societies. In developing countries, factors such as the unfair distribution of incomes, facilities and opportunities among the population lead to phenomena such as migration, social problem and poverty. Employment of manpower is the most important goal to prevent the loss of abilities of society in any country. On the other hand, unemployment is the cause of many disorders, including smuggling.

Log smuggling has existed as a long lasting problem of the forests in north of Iran with negative effects on its forest, wood economy and forest environment (Nourzad Moghaddam *et al.* 2014). Financial income from timber smuggling has led to widespread corruption and consequent social unrest. Although there are no accurate statistic data on the volume of logs smuggled from the forests in the north of Iran, log smuggling can undoubtedly have a significant share in the total volume of log harvested from the forests in this area (Shoaibi *et al.* 2010). In addition, while many efforts have been made to combat the problem of log smuggling in these forests, there are still many wood consumption centers that easily buy and consume smuggled logs. By the closure of forestry projects and

the departure of forestry project implementers, it seems that the illegal transport of wood and its widespread smuggling has become a major problem for existence and survival of Caspian forests. By the cessation of the legal wood harvesting from these forests and the need of wood consumers for broadleaf wood, these needs will be met mainly through smuggling. The detection of smuggled hardwood timber in the exit routes of Guilan Province shows that these smuggled goods are generally transported to the cities in the central and western parts of the country. Such a process has not only stopped the wood harvesting from the forest, but has also changed the type of harvesting from single selection to the best one. By the departure of the implementers of forestry projects from the forest and the reduced forest monitoring and protection, log smuggling has increased in the forests of Guilan Province.

The smuggling of timber products from the forest is done by professional smugglers, forest dwellers and some local people. Tree felling is usually done with axes and chainsaws, and the bucked logs were extracted from forest and transported to end-use points such as lumber mills, carpentry and sawmill by local workers, animals (mules), private and public vehicles. Due to the shortage of hardwoods, smuggled log has good buyers in the market and sells for about \$ 50 per cubic meter. Most of the northern hardwood trees such as alder, hornbeam, and beech, and oak are among the smuggled timber.

Although there is no accurate information about the volume of log smuggling in Guilan Province and only different reports about this issue were published in local and national newspapers and also official news agencies, it seems that there are different factors in the occurrence of log smuggling in the forests of the province. Thus, the study has considered determining the most important factors affecting log smuggling in the province.

MATERIALS AND METHODS

Guilan Province with an area of 14044 km² is located at latitude 36° 33'-38°27' N and longitudes 48°32'-50°36' E (Mohammadi-Khoramabadi *et al.* 2013; Fig. 1). The forest area of the province is about 549,537 hectares (Mirakhorlou & Akhavan 2008).

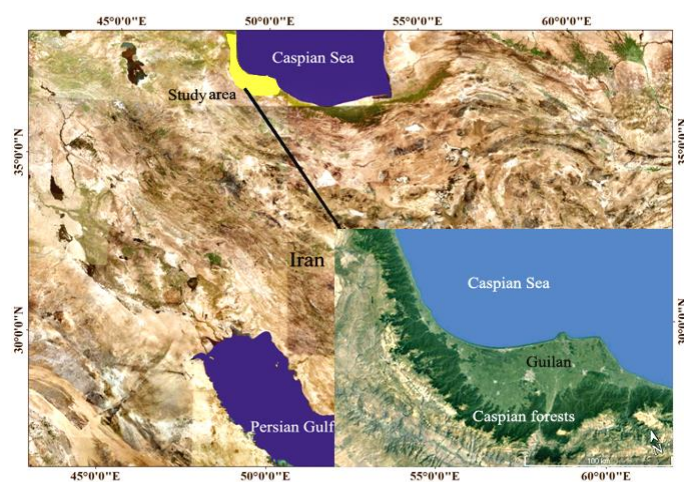


Fig. 1. Map of the study area

According to the latest scientific studies, there are 835 sawmill and wood industry in Guilan Province and 18030 people are employed in this industry (Bayat-kashkouli & Mehmandoust 2016). The study was conducted in autumn and winter of 2018-2019 in this province. Twenty four employees from the Forest Protection Department, Natural Resources and Watershed Management Organization in Guilan Province (NRWMP) were selected for the study. Delphi method was used to analyze the causes of log smuggling in this province.

In the first stage of the study, an open-ended question, asking the most significant elements affecting log smuggling in the province was presented and the respondents were asked to answer the question as cases. The questionnaires were delivered to the respondents and collected after the required time. Based on the results of the initial collected questionnaires, 15 factors affecting log smuggling were identified. In the second phase of the study, all the factors affecting the timber smuggling obtained in the first phase were placed in the form of a five-level Likert scale (strongly agree, agree, natural, disagree, strongly disagree). Accordingly, the second questionnaire was prepared and provided to the interviewees (Hosseini *et al.* 2015).

After collecting the questionnaire, data analysis and ranking of factors were performed using SPSS ver. 18 software, which resulted in the beginning of opinions convergence between participants. Using W-Kendall test, the necessity of conducting the third stage of Delphi research was assessed. Kendall's W raking test, the normalized form of the Friedman test, measured the degree of concordance among respondents as a coefficient of concordance. In this test, each respondent was considered as a judge or ranking subject, each question considered as a variable, and then the mean rank was calculated for each variables. This test examines the difference between these means by comparing the mean rankings between the variables. The value of the Kendall's W ranking test varies from 0 to 1, where values close to zero show less concordance and close to one more concordance between respondents about the variables in question. Then the items for each question were summarized and asked as the third stage questionnaire. Due to the reduced number of possible causes in wood smuggling, it was possible to compare the factors and express a relative opinion about the percentage of agreement with each factor with high accuracy. In the third stage of Delphi, the participants were asked to review the answers and reconsider their opinions and judgments if necessary and state their reasons for disagreement, and the scores of each title were rated according significance considering the mean and median (Lawrence 1999). Afterward, the list of remaining items, ranking influential factors, minority views and consensus items were distributed among the members participating in the study and also the last opportunity for participants were provided to reconsider their views. Finally, in the decision and approval stages, the final results were prepared, printed and informed.

RESULTS AND DISCUSSION

The respondents' demographic characteristics are summarized in Table 1: 79.2% were 35-year-olds and older, 79.2% had a master's degree or higher and 54.2% had 15 years of work experience or higher. All respondents were males.

Table 1. Demographic characteristics of the respondents (Forest Protection Department experts of WMOGP (N = 24).

| Age (year) | 20-25 | 26-30 | 31-35 | 35> |
|------------------------|--------------|------------------|---------------|----------------------------|
| | 4.2% (N = 1) | 8.3% (N = 2) | 8.3% (N = 2) | 79.2% (N = 19) |
| Education | Diploma | Associate degree | Bachelor | Master's degree and higher |
| | 8.3% (N = 2) | 0 | 12.5% (N = 3) | 79.2% (N = 19) |
| Work Experience (year) | 5-1 years | 6-10 | 11-15 | 15> |
| | 8.3% (N = 2) | 8.3% (N = 2) | 29.2% (N = 7) | 54.2% (N = 13) |
| | | 100 | 0 | |

According to the results, the greed of profiteers, unemployment and the need for income especially among young people, lack of planning in each forest area, poverty in forest communities, easy access to forest areas through forest roads, and closure of forestry plans with a frequency of 15, 10, 9, 8, 8 and 8 exhibited the highest frequency of answers among the expert groups respectively (Table 2).

The results of Table 2 were used to implement the second step of the Delphi method. At this stage, the opinion of all forest-protection experts in the form of 5-answer questionnaires was observed by all the individuals and the results were prioritized according to the significance and score of normalized weight. Table 3 shows the level of concordance of the Forest Protection Department experts of WMOGP with different ideas. Displacement of the causes of wood smuggling in this study is one of the characteristics of Delphi, which gradually leads to the convergence of the views of experts in each field. According to the results obtained from the second stage of Delphi (Table 3), unemployment and the need for income, especially among young people with a normalized weight score of 8.075 was the first cause of log smuggling in Guilan Province. This factor was the second most influential factor on log smuggling in the province at the first stage of the study. Systematic corruption, greed of profiteers, poverty in forest communities, failure to deal effectively with log smuggling agents, buying and selling smuggled wood without any trouble, and disregarding the role of people in forest management with rank of 6, 1, 4, 5, 5, and 8 at the first stage of Delphi, then at the second stage with normalized weight scores of 4.04, 3.91, 3.83, 3.70, 3.66 and 3.66 ranked between second and sixth

Table 2. The results of first phase of Delphi study on the factors effective in log smuggling.

| Rank | Effective factors | Frequency | Response (%) |
|------|--|-----------|--------------|
| 1 | Greed of profiteers | 15 | 14.71 |
| 2 | Unemployment and the need for income, especially among young people | 10 | 9.80 |
| 3 | Lack of planning in any forest area | 9 | 8.82 |
| 4 | Poverty in forest communities | 8 | 7.84 |
| 4 | Easy access to forest areas through forest roads | 8 | 7.84 |
| 4 | Closure of forestry plans | 8 | 7.84 |
| 5 | Failure to deal effectively with log smuggling agents | 7 | 6.86 |
| 5 | Buying and selling smuggled wood without any trouble | 7 | 6.86 |
| 6 | Continuing to wood logging as a job and supports of local people | 6 | 5.88 |
| 6 | Systematic corruption | 6 | 5.88 |
| 7 | The dependence of the wood industry market on specific types of wood | 5 | 4.90 |
| 8 | Ease of access to cutting tools from forest to mills | 4 | 3.92 |
| 8 | Disregarding the role of people in forest management | 4 | 3.92 |
| 9 | Consequences of legal harvesting and awareness of local people about the value of wood as a valuable product in the market | 3 | 2.94 |
| 10 | Lack of supervision and control of the relevant organizations | 2 | 1.96 |

Table 3. The results of second phase of Delphi test regarding the factors effective on log smuggling.

| Rank | Log smuggling factors | Significance | Normalized weight | Normalized weight score |
|------|---|--------------|-------------------|-------------------------|
| 1 | Unemployment and the need for income, especially among young people | 4.4583 | 0.08 | 8.075 |
| 2 | Systematic corruption | 4.0417 | 0.07 | 7.321 |
| 3 | Greed of Profiteers | 3.9167 | 0.07 | 7.094 |
| 4 | Poverty in forest communities | 3.8333 | 0.07 | 6.943 |
| 5 | Failure to deal effectively with log smuggling agents | 3.7083 | 0.07 | 6.717 |
| 6 | Buying and selling smuggled wood without any trouble | 3.6667 | 0.07 | 6.642 |
| 7 | Disregarding the role of people in forest management | 3.6667 | 0.07 | 6.642 |
| 8 | Continuing to wood logging as a job and supports of local people | 3.6250 | 0.07 | 6.566 |
| 9 | Easy access to forest areas through forest roads | 3.6250 | 0.07 | 6.566 |
| 10 | Ease of access to cutting tools from forest to mills | 3.6250 | 0.07 | 6.566 |
| 11 | Consequences of authorized logging and awareness of the value of wood as a valuable commodity in the market | 3.6250 | 0.07 | 6.566 |
| 12 | Lack of planning in each forest area | 3.5417 | 0.06 | 6.415 |
| 13 | Lack of supervision and control of the relevant organizations | 3.5417 | 0.06 | 6.415 |
| 14 | Closure of forestry plans | 3.2083 | 0.06 | 5.811 |
| 15 | The dependence of the wood industry market on specific types of wood | 3.1250 | 0.06 | 5.660 |

Kendall test was used to compare the ranks among the variables (questions) exhibiting that there was no agreement between the respondents about the questions (Table 4). In addition to determining the significant difference in the mean rankings of the questions related to the causes of log smuggling, this test also showed the prioritization of indicators. The results of Kendall test also revealed that unemployment and the need for income, especially among young people (11.70), official corruptions (9.10) and greed of profiteers (8.81) were in the best orders. Also, lack of supervision and control of the relevant organizations, closure of forestry plans, and the dependence of the wood industry market on specific types of wood with an average rank of 7.41, 6.29, and 5.87 were in the most unfavourable orders respectively.

Table 4. The results of Kendall's W test among the questions asked about the causes of log smuggling in Guilan Province.

| | N | 24 |
|--------------------------------------|---|--------|
| Kendall's Coefficient of Concordance | | 0.103 |
| Chi-Square | | 14.680 |
| Degrees of freedom (df) | | 14 |
| Asymp. Sig. | | 0.200 |

Table 5. Mean rank of the questions on the causes of log smuggling in Kendall's W test ranking.

| Row | Questions of log smuggling agents | Mean rank |
|-----|---|-----------|
| 1 | Unemployment and the need for income, especially among young people | 11.70 |
| 2 | Systematic corruption | 9.10 |
| 3 | Greed of profiteers | 8.81 |
| 4 | Poverty in forest communities | 8.29 |
| 5 | Failure to deal effectively with log smuggling agents | 8.06 |
| 6 | Buying and selling smuggled wood without any trouble | 7.97 |
| 7 | Disregarding the role of people in forest management | 7.93 |
| 8 | Continuing to wood logging as a job and supports of local people | 7.83 |
| 9 | Easy access to forest areas through forest roads | 7.79 |
| 10 | Ease of access to cutting tools from forest to mills | 7.77 |
| 11 | Consequences of authorized logging and awareness of the value of wood as a valuable commodity in the market | 7.64 |
| 12 | Lack of planning in any forest area | 7.47 |
| 13 | Lack of supervision and control of the relevant organizations | 7.41 |
| 14 | Closure of forestry plans | 6.29 |
| 15 | The dependence of the wood industry market on specific types of wood | 5.87 |

According to the results of the third stage of Delphi method, five studied factors were at the top of the factors studied with the concordance of over 80%. Unemployment and the need for income, especially among young people, with 94% of the final concordance of selected experts had the highest priority among the factors effective on log smuggling in Guilan Province. Systematic corruption (89%), poverty in forest communities (86%), failure to deal effectively with log smuggling agents (84%) and failure to deal effectively with log smuggling agents (82%), according to the forest protection experts, were in the next ranks of the log-smuggling causes in this province.

National and international concerns about timber smuggling have increased in recent decades, and nowadays accompanied with illegal logging, are the main causes of deforestation, which in addition to reducing the quality of forests, lead to deforestation. Of course, the role of socio-economic and political problems cannot be ignored (Contreras-Hermosilla 2001; Contreras-Hermosilla 2002; Kaimowitz 2003; Tacconi *et al.* 2003; Tacconi *et al.* 2004; Tacconi 2007). Evidences showed that in total, smuggled timber has a potential value of about \$ 22.5 billion a year, and the loss of developing countries is about \$ 15 billion a year (Tacconi *et al.* 2003). Studies in Indonesia showed that about 40 million cubic meters of wood are smuggled in the country's forests annually, endangering the sustainability and future of these forests (Obidzinski *et al.* 2006). Log smuggling can be defined from different aspects. The main factors determining log smuggling and its effects on biodiversity, people, livelihoods and the national economy are still not well understood, although many speculations and measures taken to address the problem in this regard are unsubstantiated (Inoguchi *et al.* 2005). The results of this study showed that unemployment and the need for income, especially among young people, systematic corruption, greed of profiteers, poverty in forest communities, failure to deal effectively with log smuggling agents were the most important factors in the occurrence of log smuggling in Guilan Province. Over 2041 unemployed and low-income

forest dwellers live in and around the forests of the province. Illegal forest activities and logging are very common and undoubtedly pose major challenges for the sustainability of forest resources in the country and unemployment are widespread in villages beside the forest. The role of unemployment rate, especially among young people, exacerbates the problem. According to statistical information, the unemployment rate in Guilan Province in 2018 was over 12.6 (Daliri 2016). Fuel wood is one of the sources of energy supply in the province. The unemployed population of rural and forested communities plays an important role in the production and sale of this wooden product. The use of firewood in the cellulose industry has led to some forms of smuggling as firewood one, and some studies have reported the use of forest wood for fuel and rural use by 76.6% of forest dwellers and villagers in the forest (Moayeri *et al.* 2013). It is estimated that about 50 cubic meters of firwood is consumed annually by each rural household to provide required energy. Kananian (2004) has estimated annual wood consumption to be 85.4 m³ in Talesh forests, Guilan Province. The presences of non-native people along with illegal construction in forested areas increase the use of firewood for heat and energy. Inoguchi *et al.* (2005) found similar results in their study on the East Asian forests in the Philippine reporting that although law enforcement is considered as the first step in combating log smuggling, poverty and unemployment in local communities and areas around the forests are among the most important factors in this sector.

Corruption is one of the organizational phenomena that significantly complicate the development process of the country. In fact, it is a kind of norm-breaking and violation of moral and legal norms in administrative and organizational performance. Corruption is a function of accepted norms in every culture and society. Causes of corruption include economic poverty, poor income of employees, cultural poverty and lack of moral beliefs, as well as the lack of deterrent laws, and effective control systems. The most important reason for corruption is the lack of transparent structures for doing administrative work in organizations. In non-transparent office environments, the possibility of administrative corruption increases and corrupted behaviours are facilitated. Tacconi *et al.* (2003), Richards *et al.* (2003) and Alemagi & Kozak (2010) reported that the issue of corruption is one of the main causes of log smuggling. Livelihood insecurity caused by poverty and chronic unemployment is the most important problem in forested areas and marginalized communities. Field studies show that a tree with an average diameter of 30 cm can provide sufficient income to support a rural household for a limited time. Meanwhile, more greed, along with the support of log smuggling gangs, help to intensify illegal harvesting. Unclear forest boundaries, crossroads of forest lands and personal lands of forest dwellers, planting similar tree species and lack of supervision, provide greed for profiteers and consequent more smuggling. Mukul *et al.* (2013) reported that the greed of profiteers is one of the most important causes of log smuggling in Bangladesh.

In this study, poverty of forest communities was one of the most important factors in log smuggling. Nowadays, community participation in the effective management of forestry and controlling illegal activities is considered vital in many developing countries, so that, local residents are more encountered to these factors than other people. At the same time, local communities, which can be responsible for deforestation, are also influenced by the damage caused by deforestation (Inoguchi *et al.* 2005; Mukul & Quazi 2009). Due to relative poverty and unemployment in the province, especially in rural areas adjacent to forested areas, illegal forest activities are very common and it undoubtedly poses major challenges for the sustainability of forest resources in the province. Meanwhile, the role of unemployment rate, especially among young people, exacerbates the problem. The settlement of urban dwellers in forest areas and the use of forest resources to provide heat and energy increase the consumption of firewood. Poverty of forest communities, lack of legal action against firewood smuggling has provided conditions for reducing the quality of forests in these areas. A study of firewood consumption in three forest villages in Nowshahr City in Mazandaran Province, Iran showed that each household consumes an average of about 2 cubic meters of firewood per month (Nourzad Moghadam *et al.* 2014). Failure to deal effectively with log smuggling agents was another effective factor in this issue. Although there are good laws for dealing with wood smugglers, in many cases these laws are not enforced properly. In recent years, governments and international forest protection countries have placed more emphasis on combating illegal logging and log smuggling and introduced two developments, including greater community involvement in forest management (Inoguchi *et al.* 2005) and an action plan for illegal logging (Kaimowitz 2003).

CONCLUSION

Results of this study revealed that unemployment and the need for income, especially among young people, systematic corruption, greed of profiteers, poverty in forest communities, and failure to deal effectively with log

smuggling agents are the most important factors affecting log smuggling in Guilan Province. By identifying these factors, it is necessary to use a strategy to combat them for reducing the rate of log smuggling in the province. Reducing unemployment in forest communities and employment them in forest management projects, controlling corruption bottlenecks, facilitating the participation of foresters and stakeholders in forest management, providing manpower and facilities, as well as allocating more funds to the staff of the protection units, implementation of the forest management plan, effective punishment of smuggling network agents and supporting the judiciary from natural resource officers can be suggested as the ways to prevent log smuggling. However, a separate study in this area is necessary. We hoped that the results of this study will be used by the Forests, Rangelands and Watershed Management Organization in Iran and the General Directorate of Natural Resources of Guilan Province (and other interested stakeholders) to prepare and implement policies and programs aimed at minimizing log smuggling.

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