Management and measurement of MPL for accepting the risk of environmental policy

Davood Khoshnevisan[1*], Ali Zare[2] and Seyed Ali Jozi[3]

1- MSc student of Environment Management - Department of Environmental Law, Tehran Science and Research Branch, Islamic Azad University, Tehran, Iran
2- Associate Professor, Department of Law, Tehran Science and Research Branch, Islamic Azad University, Tehran, iran
3- Associate Professor, Department of Environment North Tehran Branch, Islamic Azad University, Tahran, Iran

Corresponding author: Davood Khoshnevisan

ABSTRACT: Some achievements of technology advancement and economic development have caused environmental pollution which can endanger the life of other living creatures on the earth. Human knowledge discovers ad plans new ways for human life noticed throughout the world and nowadays we observe the growth of different knowledge to protect environment. The present study tries to introduce the role of insurance companies as a mechanism to compensate for damages of environment. One of the needed instruments for commercial insurance companies to cover the environmental hazards is measuring MPL. The present study is a descriptive research using observation and interview as data collection instruments. Also environmental and commercial companies of insurance rules in Iran were studied and covering the risks of environment pollutions and management of newly emerging pollution risks was subjected to environment right rules and insurance.Certainly, insurance of environmental pollution risks is done after measurement of the risk. Measurement and estimation of MPL as a sub-category of risk management can be an instrument for insurance companies to cover such newly emerging risks.

Keywords: insurance, risk, environment pollution.

INTRODUCTION

Some advancements of technology and the growth of industries especially in developing countries such as Iran has exposed environment to pollutions and risks caused by wastes and operational processes.

Events like environment pollution disturb human balance on the earth gradually. One of the important concerns of human society is protecting environment as "the common human bequeath". Humans try to use the needed tools to protect environment to create a proper habitat for living creatures. Nowadays, those instruments should be followed that can be sued to compensate for environmental hazards. Establishment of prevention and compensation of environment risks in Iran and other countries is a significant issue.

Based on the previous research, it is understood that the role of commercial insurance policies is a mechanism for compensating the damages caused by environment pollution and also a method for protecting and sustainability of environment.

Risks and dangers of environment are considered as emerging risks. Insurers are covering emerging risks which their risk compensation is tolerable.

The results of the studies showed that insurers after considering and predicting the rate of the probability of a risk and measurement of MPL, cover the risks according to their financial wealth.

Insurers can consider the risk of environment pollution as insurable and insure it through regarding "a proportionate supply for the probable risk". However, the loss of probable damage can be beyond insurer's power. In this case, increase of risk taking capacity can be used.

Literature review
The issue of covering the environmental risks is reviewed in Iran and world.

a)World review of environmental risks:
some of the previous studies are mentioned in this part.

1-Insurance and risks of environmental responsibility
"a brief investigation of insurability conditions of environmental risks show that when the needed conditions are observed in responsibility and insurance policy rules, the risks of environmental responsibility can be insured and since environmental risks have been insured for a long time, this task is performable. However, determining the territory and risks of insurability responsibility is another issue" (Zolqadr, 2004;18).

2-Management of environment risk
"environment pollution is one of the significant concerns of developed and developing countries. Industrial and sometimes commercial activities (especially transportation) are the main factor in environment pollution. So, from long times ago, there has been the issue of responsibility of environment pollution" (Mazlumi, 1989).

1- Maximum probable loss: whenever an insurer is asked to consider the insurance right of non-tariff risks, first an accurate picture of risk quality and the related dangers is gained. Then the risk is measured and insurance right is determined. More simply, the question is raised that: "generally what kind is this risk and what accidents may happen?".

When making decisions on the share of the risk which should be protected, insurers first specify the conditions of the risk from two dimensions. Regarding the risk rate which can be predicted with total loss price, the risk is classified and the attention is paid to it to calculate the maximum probable loss (Daryabar, 1991; 23)

a)Iran review of environmental risk:
regarding the previous studies, nothing has been done in Iran in relation to the research hypothesis. So, some theses on environment- natural disasters and insurance risk mechanisms were studied which one of them is referred.
- The thesis on comparative study of loss compensation methods caused by natural disasters in Iran and world.

"The thesis studies the strategies of compensating natural disasters loss in Iran and world. In theoretical section, first natural disasters countermeasures are considered followed by the methods of natural disasters risk compensation in recent decades. The share of government, insurance companies and victims, credits of development finance and the ratio of losses to development finances were calculated. Finally, the share of natural disaster insurance in Iran and world was considered and in spite of stating natural disasters countermeasure management in Iran and other countries, the managements were studied. Experience has shown that taking the ways for crisis management to compensate the loss of the disasters has not significant effect singly and to create a desirable system for managing the crisis, the following acts should be done:
- Revising land test and building regulations,
- Extensive cooperation with countries where risk management and crisis countermeasures are developed in them.
- Taking a proper method for providing the number and the rate loss of natural disasters in Iran according to economic measures.

Presenting public insurance "mandatory and optional, natural disasters and advrtisements" (Musakazemi, 2008).

MATERIALS AND METHODS

The present study is a descriptive research and also it is applied. After collecting data from studied sources, the researcher analyzes them.

Data collection instruments are observation and interview. In this study insurance and environmental regulation books of rules and codes are sued. The rules and regulations include:
- Set of rules and regulations, instructions and proceedings of Iran insurance industry.
- Set of rules and regulations for protecting environment.
- Set of issued insurance on engineering insurance responsibility, responsibility, freight and firing of ASIA and Iran insurance companies.

Specified study purposes

There are lots of accidents in industries and urban life bringing environmental risks. These emerging accidents have had disasters like Bupal (India) disaster, Khorasan carrying of chemical fertilizers, financial, physical and natural losses. Nowadays to prevent environment crises, some strategies should be taken to control the speed of the accidents or prevent its development.

One of loss and environmental risk compensation methods is using commercial insurance companies. These companies can cover the risks of according to legal contacts after measuring the risk and embark on compensation of losses if happened.

The present study efforts to consider insurance company as mechanisms for protecting environment and introduce an instrument called MPL measurement for environment pollution risks to cover these emerging accidents.

Research hypotheses

Commercial insurance companies are considered as dynamic agencies which can provide confidence for society through transferring the risk to companies.

Risk transferring in environment pollution can be done in the framework of technical and financial problems on behalf of the i9nsurance company. Transferring the risk needs to identify, separate, manage and measure it.
MPL measurement is used in the present study to accept environment pollution and the research hypothesis is based on it:

"calculating and measuring MPL is necessary and inevitable for accepting the risk of environment insurance and issuing it".

RESULTS AND DISCUSSION

Establishment of prevention and compensation of environment pollution loss is necessary in Iran and other countries. Advancement of law and legal sub-disciplines, science relations and new knowledge has made a mixture of human sciences which can play an important role as mechanism in all parts of human life. Some of juristic don't consider environment loss as a loss for the society or individuals but as a loss to "common assets of the nations". Using this "common human heritage" (present and future generations) is an undeniable right and protecting environment is a duty for all members of international community.

Based on the previous studies it is understood that the role of commercial insurance as a mechanism for timely compensation of environment pollution and a way to protect and sustain the environment is very important.

Insurance company can accept environment pollution in the framework of their legal rules and insurance regulations and issue the insurance. When considering MPL, if loss rate is more than the company's power, the main insurer with the help of domestic or foreign insurance companies reinsures the case.

Considering the hypothesis

To explain the topic, first insurability of environment loss, MPL and then complexities and measurement of MPL are referred.

a)Insurability of environment loss:

Environment loss and risks are considered as emerging risks. Certainly insurers cover emerging risks that they can come up with their loss compensation.

The results of the studies show that environment pollution risks can be insured by commercial companies in a contract observing the principles of insurance contracts (principles of goodwill, compensation, insurance benefit, substitution and comparative capital principles). Accidental environment risks, unexpected and unofficial risks can be covered with mandatory or optional policy. After evaluation the rate of loss and prediction its occurrence, the insurer accepts the risks according to his financial capability.

Regarding a "proportionate supply for probable compensation", the insurer can consider environment pollution as insurable and insure it. However, the loss of probable damage can be higher than the insurer power that in this case increasing the insurability risk can be used.

Environment pollution risks responsibility follow responsibility rules of public law or civil right system. However environment pollution loss is not considered a loss to persons; it is a loss to "common assets of nations". So, environment loss can be planned in general law in the form of responsibility.
Depending on "indemnification on behalf of the operator", more effective development of insurance policy is done to prevent and control the pollution. So, this principle is a proper supporter for correcting and improving environment responsibility.

b)MPL or Maximum Probable Loss

Whenever an insurer is asked to calculate the insurance right of non-tariff risks such as engineering plans, an accurate picture of the quality and the related risks is gained and the risk is measured and insurance right is determined proportionate with it. The question is that: generally what kind is this risk and what accidents may happen?

When deciding on the share of the risk which is protected and accepted by the companies, insurers determine the risk conditions from two directions:

1- Classify the rate of the predicted risk depending on risk degree.
2- Calculate MPL and based on this, when a share of a risk is suggested to insurer, first MPL is considered. Finally, counting on measurement accuracy and considering financial power and the current commitments and also risk desirability level, the company accepts or rejects some percent of the risk (Daryabar, 1991;23).

In fact MPL is a state of loss when may happen when mixing and combining the most unfavorable conditions. For example, the maximum probable loss of a firing happens when it is not confronted properly and only stops when there is not flammability and the fire is confronted with impenetrable obstacles. Swiss Rey goes beyond MPL and considers the firing in as the occurrence of a loss in the worst conditions and because of this, MPL probable state before explosion can be guessed (Swiss Reinsurance, 1998;52).

Risk in insurance

The risk is caused insurance and without risk, insurance will lose its existential concept. In a society where there is no risk, there won't be any insurer because there is no need to it. risk has different types or forms but regarding different changes and its variety, it has one dimension and fixed result that bad, undesirable and negative risk is unpleasant and we can consider the risk as the undesirable and unpleasant and harmful result of the accident. Chance is opposite or risk which has a good, desirable, positive and pleasant dimension. So, chance can be regarded as positive, pleasant, desirable and beneficial result of the accident. Uncertainty and accidence is accompanied by risk and chance meaning that future accidents can't be predicted in advance. If an accident can be predicted beforehand, insuring such accident doesn't have a meaning. If insurance is asked for an accident with certainty of the result, the insurer company won't issue insurance for it and if it agrees to insure it, the cost will be very expensive which is not affordable for the company.

Inversely, insuring the accident having a finite chance element and positive result is wasting insurance right even if it is very low and cheap (Karimi, 2011;59).

d)Risk management in insurance industry

Risk management is application of management factor in a specialized field. Henri Fayol is one the most famous French theoreticians in general management defining management as:

"management is prediction, planning, organizing, commanding, associating and control. Prediction and planning are the concepts of future consideration and providing a practical program. Organizing is regulating the material and humane structure and commanding is controlling the activity of organization human force. Association is unifying and consolidating all affairs and activities. Control is having a topic that everything in the society happens based on specific instructions and rules". Risk management includes all these activities (Williams-Hinz, 2007;66).

Risk management should notice preventive acts for unrecognizable risks including discarding, reducing and transferring. Risk attraction and discarding won't be possible until "the security in product longevity" has not become a part of organization's risk policy. So, generally risk reduction is verified more, however, in this case risk control methods are used less due to high costs of utilization. Removing lots of recognizable risks can be achieved without extra costs. So, risk reduction changes to instructions that should be followed by staff.

In an environment with strong management, risk transferring to higher levels introduces and develops automatic protective and security systems. It is true for good managers that want to ensure flowing activity and devoid of organization hidden problems (Mazlumi, 1989;4).

e)Management of environment risks in insurance

There are complex methods to evaluate environment risk in developed insurance markets which have been compiled based on the resources of market special data, accessible information for public and environment management strategies existed previously in the market.

In emerging markets, this information is not always accessible. Also, technological standards of environment risk management are different in various parts of the world. so, Primary methodology of environment risk management in emerging and developing markets should be adapted with other parts of the world and then utilized.

Risk management is a dynamic process and when it is going to be performed, risk management cycle should be adapted with changing environment.

The followings should be specified in environment risk management:

1- The kinds of risks and dangers of an industrial activity, transportation process, the kind and amount of the used and stored harmful material;
2- Different kinds of risks existing around the location of the company
3- Activities that the company does to prevent polluting disasters or reducing the events which are potentially harmful.

The first and the second cases are bordering and limiting conditions for a special industry, but the third case is adapted based on a special company's policies of risk management. It can act as a distinguishing factor (company performance) (Haeri, 2004;168).

f)Complexities of environment risk management

Considering risk of environment pollution has its special complexities including:

1- Time interval between the cause and the effect of an accident
2- Intangibility of carcinogens tracks
3- Complexity of measuring the loss
4- Eternal limitation of discovery possibility
5- Absence of specified responsibility for polluting effects during the life of a product
6- Acting approvals instead of law by government
7- Presenting insurance cheaper than compensatory solutions (Mazlumi, 1989;4).

g)Measuring MPL and various risks

MPL measurement is not done in all risks. It is not considered a necessary part in all cases because most of insurance topics or risks are known for the company through experience and technical knowledge. Insurance company covers the risks and issues that they can come up with the loss compensation.

h)MPL of environment risks

MPL is an assessment expert operation based on a damaging accident probability. MPL expert evaluates MPL of an accident based on probable events and announces the MPL regarding the maximum of financial loss for compensating the loss or preventing the accident.

It can be said that MPL of environment risk is the scenario of probable loss which the maximum of financial loss is calculated when happening.

MPL amount will help the insurer company to answer its main questions. The main question for companies when covering the probable environment risk is the amount of the probable loss when an accident happens probably and can the insurer company cover the risk based on its financial power or not?. The insurer company comes up with the two questions to cover probable environment risk, so, it should move to MPL evaluation.

Calculating MPL may have dire results especially for environment pollution loss that the impacts and outcomes of the accidents may become apparent after years or the loss may be seen many kilometers away from the accident.

i)Environment risk evaluation in insurance policy

The previous studies show that insurance company may consider the following issues in accepting environment risks:

1-Accidental danger of environment risk

Environment pollution risk can be covered with insurance company when it happens accidentally. When a working automobile pollutes the air, it can be observed that the car is working and air pollution by car is accepted on behalf of us and the pollution continues as far as the car is working. In this example, we are aware of air pollution and accept it but, in environment pollution risks, the danger should happen accidentally and suddenly. This issue excludes the accidental and sudden estate of the accidents and pollutions we know them or the pollutions that exist constantly.

1-The range of pollution risk

An insurance company covering pollution risk should evaluate the risk range. In a hypothetical accident where chemical reservoir is leaked in a factory, the amount and the range of chemicals penetration and its permeation to soil is measured.

1-Measuring the maximum probable loss for environment pollution
When an environmental risk is evaluated before the accident and its loss range is identified, the insurer company should calculate the rate of MPL.

j)Calculation of MPL by insurance companies for insurance contracts
Previous studies show that insurance company can have different view after starting environmental pollution risk MPL measurement.
1- When MPL of an environment pollution accident is not measurable, the risk is not accepted. In spite of insurance company to benefits and losses, a risk is accepted when loss compensation is possible. So MPL is necessary for accepting probable risks.
2- When MPL of environment pollution is so expensive that it is beyond domestic and international companies' power to compensate it, the risk is not accepted.
3- When MPL of an environment loss is beyond the power of insurer, the risk covering can be done in two ways: A) Consortium, B) reinsurance.
4- When MPL of an environment accident can be afforded financially, the insurer company can accept the pollution risk in the framework of legal insurance right.
So, the necessity of measuring MPL of environment risk makes the insurer company evaluate and measure its financial and technical status and decide on accepting or rejecting the loss. If the loss is accepted, the kind of insurance cooperation is offered in a legal contract.

CONCLUSION

The results of the present study showed that environment pollution risk can be insured based on insurance legal terms. To this end, special stages should be considered:
1- First environment risks should be identified and distinguished. In identification process, the risks should be noticed that are accidental and the cause of pollution, the factors of pollution, the kind of the loss and expansion of loss range can be identified.
2- Risk management is of special importance in pollution risks. Certainly, in management risk, managerial techniques including preservation, escape, prevention, reduction, transfer, combining and neutralization are used. Environment risk management can be done on behalf of insurer and underwriter. Risk management is done through software and hardware methods on behalf of industry owners and the method of risk covering and insurability are noticed by insurer in risk management. In the first stage, the attention of insurer to duration of risk is related to "the range of probable loss" and MPL is considered. Having a preventive and futuristic outlook, insurer company identifies and organizes potential loss that can happen in organizational cycle. In another stage, developing the needed skills and proper control, the risk of accident happening is reduced or the range of loss is limited. Regarding the proper control of the probable risk and reducing the occurrence of the accident is done through expert considerations and the presentation of specialized conditions and noting them in insurance is done. Regarding limiting the range of loss, the insurer plays its role and commitment by quick and timely loss compensation and presentation of financial reimbursements. Measuring environment pollution MPL is assessing loss compensation costs to prevent expansion of loss or compensating it.
3- The third stage in covering the environment pollution is MPL measurement by the insurer.
First the pollution risk is identified and regarded in MPL measurement and considers that if the probable event happens and there is not any preventive factor, how much will be the maximum loss. So, in spite of the attention of insurance company to loss and benefits, a risk is insured when the company can tolerate it but, when a probable risk can't be measured or calculated or the assessment of the loss is higher than the power of the company, it is not considered.
4- Insurance company have a financial wealth which based on it can cover insurance risks. When a risk is evaluated and its MPL is assessed, the insurer company evaluates its financial power to cover it for compensating the probable risk.
The insurance company treats with the insurable risk in the following ways:
- Cover the risk directly.
- Cover the risk jointly with one or some insurance companies.
- Reinsure the risk.

5- When the insurance company considers the pollution environment as insurable, it embarks on preparing the insurance contact which is one of the most difficult technical issues insurance. The insurance company starts a comprehensive data collection based on "risk identification" collaborating with insurance experts and the insured person and compiles the text of insurance. Depending on statistical and mathematical calculations, the insurance right is determined.

Regarding the need of insurer to evaluate its financial power and the rate of probable loss and the need to know about the company's commitment rate, MPL assessment is a necessary task. Finally it can be said that calculation and evaluation of MPL to accept the risk of environmental insurance policy is inevitable and necessary.

Suggestions:

Protecting and keeping environment is one of important human tasks. The present study tried to get insurance knowledge closer to environment right knowledge and traverse a step to develop insurance impact on protecting the environment. The following suggestions are provided to advance and develop insurance industry:

1- Educating the specialized force in environment insurance policy.
2- Cooperation between environment organization central insurance (J.A.A) to enact the needed rules to create environment insurance policy.
3- Forming specialized insurance companies in environment field.

Allocating environment, pollution and other related courses for insurance students.

REFERENCES

Daryabar M. 1991. "MPL: maximum probable loss". Insurance research magazine. Insurance research center under supervision of Iran Central Insurance. Fall, 1991. No.23. p.24.

Karimi A. 2012. "generalities of insurance". Tehran. Insurance research magazine. Insurance research center under supervision of Iran Central Insurance.

Musakazemi SJ. 1998. "investigation of comparative methods of loss compensation caused by Iran and world natural disasters. M.A thesis. environment management. Environment and energy faculty. Azad University. Science-research branch (2008). Nouri, Mostafa." Swiss reinsurance: familiarity with MPL". Insurance research magazine. Insurance research center under supervision of Iran Central Insurance. Winter, 1998. No.52. p.50-57.

Williams C, Hitz A, Damm R. 2007. Translated by Venus Davar, Gudarzi, Hojjatollah. Risk management. Negah-e-Danesh.

Zolqadr M. 2004. "insurance and environment risk responsibility". News of insurance world magazine. Insurance research center under supervision of Iran central insurance. January, 2004. No.81. p.6.