Monitoring and Enforcement of Occupational Safety and Health Standard in Banana Plantations: Does Non-Compliance Pay?

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***Abstract*: Like other laws and regulations, enforcement of the Occupational Safety and Health Law does not happen without the compulsion from government authorities accompanied by work-site inspection and penalties. Becker and Stigler (1974) confirms that the aim of enforcement is to attain that desired degree of compliance with the rule of prescribed behavior, and the critical reason that prevents an entity from enforcing full compliance is that enforcement is costly. This study extends the classroom game conducted by Anderson and Stafford (2006) wherein it highlighted the business unit's responses to changes in monitoring probability relative to changes in enforcement severity. The game was put into an actual setting of analyzing the dynamics of enforcement strategies in the context of banana plantations. This study confirmed that all business units that have been caught in the past will be inspected each day, and for those that never been caught will be selected at random for inspection. Also, it confirmed that having been caught as non-compliant generally does not result in more compliance unless past violations increase future fine or punishment. Though there was no significant increase in fines, the banana farms exhibited an increased level of compliance. This performance is suspected to be due to the banana plantations' natural response to the successive results of inspections because of the recurring non-compliance.**

***Keywords:* economics of enforcement, OSH standard, banana plantations, Personal Protective Equipment**

I. INTRODUCTION

Background

This study was conducted to come-up with an enforcement strategy that may improve the level of compliance of the banana plantations with the OSH Standard or the Department Order No. 198. It focused on the major question: What is the optimal enforcement regime that significantly influences compliance with OSH Standard?

Specifically, this study asked the following:

- Does the level of compliance increase as the expected fine increase?
- Do the low probability of inspection and higher fine combinations induce more compliance than the high-probability and low fine combination?
- Is there a significant relationship between level of compliance with OSH standard and its factors?

Scope and Limitations

The OSH Standard in the study referred to the Department Order No. 198 of 2019. This is the applicable law that envisions protecting the vulnerable workers from exploitation. For the OSH Standard, the provision of Personal Protective Equipment (PPE) was used in measuring the level of compliance. Specifically, these regulations were lifted from the Labor Laws Compliance Assessment Checklist.

The Law implies that "employers provide appropriate PPE to workers exposed to different types of hazards."

The study covered the 4 Managed Banana Farms of UPI Group from weeks 6 to 18 of the year 2019. The farms are: Farm 1, Farm 2, Farm 3, and Farm 4.

II. MATERIALS AND METHODS

Analytical Framework

Using Becker's Crime and Punishment (1968) mathematical expression of social loss, the loss is the sum of the damages due to OSH standard non-compliance plus the cost and losses due to enforcement of law and punishment of violators:

$$L = D(O) + C(p, O) + bpfO$$

Where;

- L - represents social loss from non-compliance with OSH standard;
- O - is the supply of offenses or the incidence of violation of the law per employed worker;
- $D(O) = H(O) - G(O)$, refers to damages or the net effect of lost earning per worker and monetary gain of an employer per worker due to law evasion. This composite function shows that increase in offenses will increase damages to society;
    - Harm - is the harm done or loss in workers' earnings due to noncompliance with Standard;
    - Gain - is the employer's expected additional profits for not complying with the OSH standard. This is one of his incentives not to comply with the OSH Standard.
- C (p, O) - is the cost of apprehending and convicting the violators, which are affected by the probability of

being inspected by DOLE and be convicted in court (p) and the number of offenses (O) committed by the employer per worker during the period.

- bpfO - is the total social loss from punishing the employers.

The analytical framework is a vital element in creating a policy. Basically there are two options to consider:

Option 1: If the aim simply is deterrence, the probability of conviction ***P,*** could be raised close to 1, and punishments (or fine) ***f,*** could be made to exceed the gain.

- Result: In this way these number of offenses *O*, could be reduced almost at will.

Option 2: If the aim is to make "punishment fit the crime."

- Result: *p* could set close to 1, and f could be equated to the harm imposed on the rest of society.

Becker's Crime and Punishment suggests evaluating the dimensions of non-compliance of workers. It is hypothesized that the non-compliance contributes to the changed social life of workers. Hence, it is a social responsibility concept which reveals the possible grave effect of non-compliance with the law.

Enforcement of OSH Standard

Employers and concerned national institutions are duty-bound to enforce measures designed to ensure effective OSH standard implementation (ILO, 2006). Labor standards, for example, are important instruments to ensure that fundamental rights and principles are taken into consideration in the workplace. In other countries, however, there are challenges in applying the labor standards. According to the International Labor Organization (ILO, 2014), child labor is most prevalent in the agricultural sector, accounting for 59% of those in child labor, representing 98 million children.

It is therefore vital that each country maintains a vital and active labor policy formulation and implementation. To answer this concern, relevant ILO instruments such as the Labor Inspection Convention, 1995 (No. 81) and Labor Inspection for Agriculture Convention, 1969 (No. 129) provide guidelines in the proper application of labor legislation. Furthermore, to have an effective labor inspectorate program, inspectors examine how national labor standards are applied in the workplace and advise employers and workers on how to improve the application of national law in such matters as: working time, wages, OSH, and child labor. As such, labor inspectors play an important role in ensuring that Labor Laws' OSH Standard is applied equally to all employers and workers.

Challenges in the enforcement of OSH Standard in agricultural firms

In labor inspection, for example, one of the challenges is that labor inspectors are underfunded and understaffed, and consequently unable to do their job. Some estimates indicate that in some developing countries less than 1% of the national budget is allocated to labor administration, of which labor inspection systems receive only a small fraction (ILO, 2014).

In the Philippines, it was emphasized that the guiding principle of the related laws are the promotion of employment and the observance of the rights of workers to just and humane conditions of work, security of tenure, self-organization and collective bargaining. Furthermore, the Department of Labor and Employment (DOLE) of the Philippines has been perpetually challenged by the limited technical capacity and the huge disparity between number of labor inspectors compared to the increasing number of establishments (Hirose & Vitasa, 2007). This challenge on enforcement is supported by Weil (1996), wherein there has been a small number of inspectors compared to the number of establishments and the low level of fines contributed to the failure. The firms are only conditioned to comply because of threat of inspection and high fines per violation committed.

While several policies have been adopted in the Philippines to rationalize the enforcement of labor standards related to working conditions and Occupational Safety and Health (OSH), there are some ILO conventions that remained unratified – Labor Inspection Convention, 1947 (No. 81) and Labor Inspection (for Agriculture) Convention, 1969 (No. 129). This situation is mainly caused by institutional void which pertains to the result of the breakdown of markets and governance (Dixit, 2009). Hence, the gap between agricultural firms and ordinary workers that can only be bridged by incurring high transaction costs. Further, the engagement with subcontractors, leased labor, and ambiguous employment relationships present major challenges between the farms and enforcing agencies.

Opportunities for improvement in compliance

Most establishments are subject to some forms of government regulation, ranging from the OSH requirements all the way to the licensing and permitting guidelines. These institutional arrangements, influence the establishments to devote resources to ensure that regulations are met. OSH requirements, may have positive impacts on productivity in terms of managing loss time due to injuries on the job (Sharp, Register, & Grimes, 2013). The introduction of Health and Safety Committee (HSC), for example, in the establishments was associated with a lowering of injury rates and decrease in the number of severe injuries (Barling & Frone, 2004).

The concept that the decision of the firm to comply with OSH Standard is anchored on the particular enforcement of regulation (Stafford, 2006). Based on this concept, it opens an opportunity to determine if enforcement of fines and announcement of inspections have different effect on compliance behavior. This study investigates the relationship of two institutional factors: Enforcement by Regulating Agency and Compliance by establishments. These two factors are supported by the concept of Behavioral Economics wherein employers maximize profits and maximize utility. Per constraints being faced, cost and benefits are always weighed to choose the best possible course of action (Mankiw, 2004).

Hence, the concept of this study supposes the idea that although the stimuli of engaging in a wrongdoing may vary among establishments, there must be some general explanation in trying to understand the factors that influence compliance or non-compliance with OSH Standards.

Conducting the Demonstration: Implementation of different enforcement schemes

The study was designed for 4 banana plantations. In each banana plantation, there are departments that were treated as business units. Each business unit earns a revenue of P1,000 a week net of all production costs. The local regulation requires that each operation follows the mandatory program by implementing the Company's PPE Policy.

The PPE Policy implementation costs P300 a week which involves the following mandatory programs: PPE Supply level is well-maintained (20% monthly minimum inventory of appropriate PPE every after withdrawal); Assigned workers use appropriate and functional PPE during the operation; and worker has attended the latest PPE Policy orientation.

The Mandatory program is enforced by the Safety Officer. The Safety Officer can inspect on business unit a week (or at planned intervals) by choosing randomly each day which area to visit by drawing the name of one business unit from a "random generator" containing the names of workers under the different business units.

In the event that a worker of a particular business unit failed to implement the PPE mandatory program, a fine of P500 will be charged. However, if the safety officer inspects the department and finds out that the mandatory programs are implemented, there will be no fine.

In contrast to the game conducted by Anderson and Stafford (2006) in a classroom setting, this study provided an instrument to measure the level of implementation by using a 5-scale Likert Scale (5 as the highest).

III. RESULTS

Different Enforcement Schemes Results

Table 1 presents the suggested enforcement schemes with the corresponding results and findings. The game started at Week 6 wherein the original enforcement scheme took place:

> *"The frequency of inspection is once a week with a fine of P500 per violation (if the level of implementation is below the threshold level of 3, as per 5-point Likert Scale)"*

It was also noted that as early as week 6, there were corporate farms (e.g. Farm 1) which did not submit their reports contributed to the low ratings under the percentage of Corporate Farms' gain after compliance and level of compliance.

Table 1. Week 6-18 – Different Enforcement Schemes' Results and Findings

Week	Probability of inspection	Fine	% of Corp Farms' Gain after Compliance	% Level of Compliance	Findings
6	1 in 5 days (.20)	P500	29	54	Farm 1 not submitted yet.
7	1 in 5 days (.20)	P500	33	81	Farm 1 joined the monitoring (Area 1, Area 2, Area 3)
8	1 in 5 days (.20)	P500	38	95	The increase in the level of compliance was contributed by Farm 3 and Farm 2.
9	1 in 5 days (.20)	P500	35	72	Farm 1- missing report.
10	1 in 5 days (.20)	P500	44	89	Increase of rating is contributed by Farm 1's submission.
11	2 in 5 days for with past violations (.40)	P700-800	35	92	The scenario exhibits inverse relationship. Increase of rating is contributed by Farm 1.
12	2 in 5 days for with past violations (.40)	P700-800	37	93	Departments quickly improve their compliance. Increase is attributed to Farm 2.
13	2 in 5 days for with past violations (.40)	P700-800	38	87	All farms' level of compliance has declined. This contributed to the decrease of % level of compliance.
14	2 in 5 days for with past violations (.40)	P700-800	39	96	This is the highest rating of performance, so far. The new (and stricter) enforcement strategy may contribute to the level of compliance with PPE Policy.
15	Non-compliant in the past will be inspected on Monday, Wednesday, Thursday	P700-800	35	89	All farms have decreased their level of compliance on Week 15. It is suspected that the farms adjusted to the revised enforcement strategy
16	Non-compliant in the past will be inspected on Monday, Wednesday, Thursday	P700-800	50	87	The level of compliance continued to reduce, except for the % of gain after compliance. The increase in gain (after compliance) may be contributed by the farms' partial compliance- as revealed in the Mon-Wed-Thurs follow up inspections.
17	Non-compliant in the past will be inspected on Monday, Wednesday, Thursday	P700-800	37	92	The theoretical inverse effect for % gain after compliance and % of level of compliance is realized on Week 17. This revealed that as the farms respond to the result of inspections, they gradually improved compliance.
18	Non-compliant in the past will be inspected on Monday, Wednesday, Thursday	P700-800	47	89	In contrast with the scenario in Week 17, the inverse relationship came into play on Week 18. However, it is the level of compliance which has already declined while the gain after compliance has increased. This may be influenced by some farm operations which consistently displayed a non-compliance for the PPE policy.

The percentage of farms' gain after compliance means *"the income or points that the departments/business units gained after complying with the PPE Policy"*. Basically, a business unit has to spend a particular amount (in this study- P300/week) of money to comply. This may be one of the reasons that many companies failed to comply regulatory standards because most of the time enforcement is costly (Becker & Stigler, 1974).

Consequently, it is believed that there is an inverse relationship between the level of farms' gain and the level of compliance. To investigate this hypothesis, it is ideal to define first the percentage of farms' compliance which is the *"overall percentage of departments/business units among corporate farms that comply with the PPE policy"*. Results revealed that as of Week 11, the percentage of gain and percentage of farms' compliance exhibited inverse relationship. Basically, the increase in overall farms' level of compliance is contributed by Farm 1. Based on the revised enforcement scheme:

> *"that all departments/business units' workers that have been caught in the past as non-compliant will be inspected twice a week, Compliance cost: P300; Fine: P700-800,"*

one farm concretely conformed to the hypothesis: "Compliance increases as the expected probability of inspection and fine increase." Data revealed that Farm 4 (see Annex 1) is suspected to have increased its level of compliance as of week 11 (vs. wk 10) wherein the new enforcement scheme is implemented. Furthermore, for week 14, the overall corporate farms' performance has increased from 84% to 96%. It is suspected that this increase may be contributed by all farms satisfactory performance, with regards to the revised enforcement scheme for week 11-14.

Figure 1 presents the results using the enforcement schemes indicated in Table 1. As shown, the variations of level of fines did not have a significant effect to the level of compliance. Hence, it contradicted to the 2 hypotheses: (1) Compliance increases as the expected fine increases; and (2) low probability/high fine combination induces more compliance than the high-probability/low-fine combination.

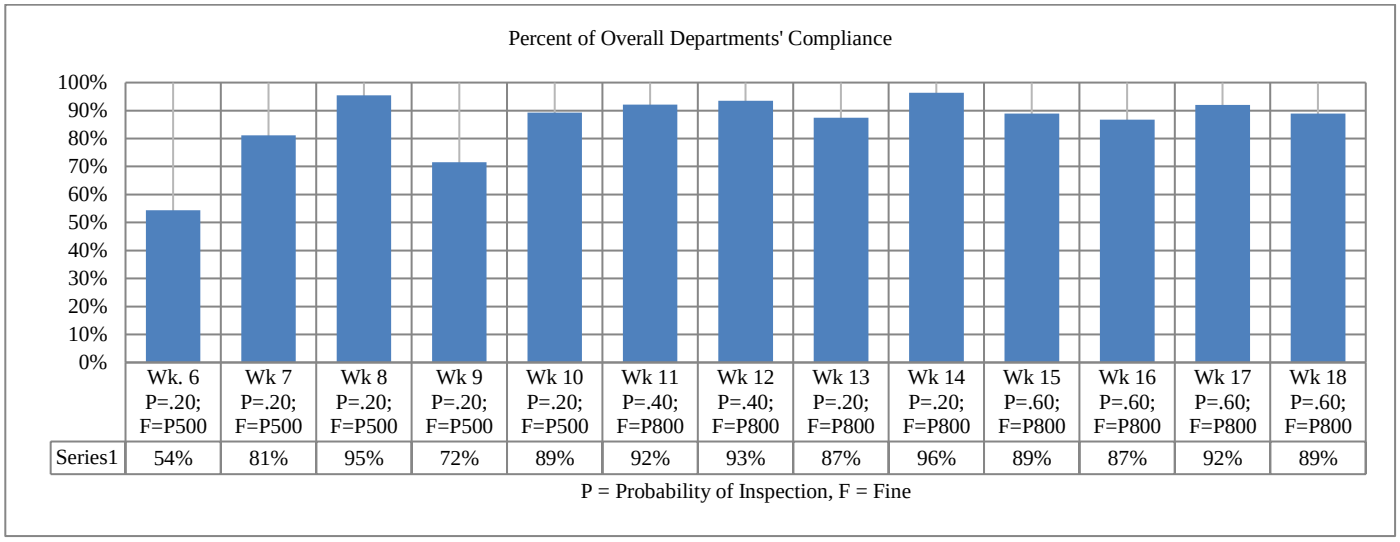

Figure 1. Sample Results Using Suggested Enforcement Schemes

The highest level of compliance occurred on Week 14 wherein the fine is 2.6 times the cost of compliance. One of the suspected reasons on why there is a relatively low variability among the level of compliance is that this study mainly adjusted the frequency of inspection along with the variations of fines. In contrast with the study of Anderson and Stafford (2006), the fines were adjusted corresponding on the compliance history. It was stated that full compliance is achieved when the expected fine is given accordingly, for example, $1000 for first-time offenders and $2000 for second-time offenders.

In week 15, a new enforcement scheme was implemented:

> *"Non-compliant in the past is inspected every Monday, Wednesday, and Thursday; Compliance cost: P300; Fine: P800"*

Results revealed that all farms decreased in terms of their level of compliance with the PPE Policy. It is suspected that the business units adjusted to the revised enforcement scheme. Another possible reason is that the farm management had a hard time correcting the non-compliance by providing appropriate PPEs to the involved workers within the week. For that reason, the level of compliance continued to decline in week 16. The increase in gain (after compliance) may be contributed by the farms' "partial" compliance- as revealed in the Mon-Wed-Thurs follow up inspections. The theoretical inverse effect for percentage of gain after compliance and percentage of level of compliance is realized on Week 17. This revealed that as the farms respond to the result of inspections, they gradually improved compliance.

In contrast with the scenario in Week 17, the inverse relationship came into play on Week 18. However, it is the level

of compliance which has already declined while the gain after compliance has increased. This may be influenced by some business units which consistently displayed non-compliance with the PPE policy.

IV. CONCLUSION

Based on the results of the different enforcement schemes, this study concludes that there is no significant effect in terms of level of compliance when the amount of fine was increased. Hence, there is no significant effect or variations of level of implementation in terms of low probability/high fine or high-probability/low-fine combinations.

Among the three enforcement schemes, the 2nd one (that took place in weeks 11-14) has the most effective result in terms of implementation because it yielded the most positive result in terms of percentage of compliance. It states *"that all departments/business units' workers that have been caught in the past as non-compliant will be inspected twice a week; at Compliance cost: P300 and Fine: P700-800*". Hence, this may be the most appropriate way of enforcing the monitoring program in the context of Unifrutti Corporate banana plantations.

Basically, the low values under the two categories (1) Percentage of farms' gain after compliance and (2) Percentage of Departments' Compliance can be exclusively interpreted. Though the two have an inverse relationship, there are factors that may affect the changes in percentage.

Under the farms' gain after compliance, the following scenarios may be considered:

a) A relatively low value may be influenced by a full compliance OR it may be because of successive fines due to noncompliance.
b) A relatively high value may be caused by consistent compliance (avoided the fines) OR it may be because of successive wilful non-compliance (to do away with compliance cost).

On the other hand, under the departments/business units' compliance, the following possible interpretations may be considered:

a) A relatively low value may be influenced by successive non-compliance.
b) A relatively high value may be caused by consistent compliance.

Hence, in one way or another, it is not only the concept of enforcement cost (Stigler, 1974) that matters in terms of consistent implementation of standards but also the offenders' premeditated act of comparing the benefits and costs of non-compliance. This is in accordance with the Becker's (1968) view that the offenders are actually acting rationally under the circumstances of uncertainty regardless of the amount of fine or frequency of inspection.

In addition, the result of the study affirms to Anderson and Stafford (2006) which found out that it is to be particularly effective if changes in the enforcement scheme implied as being influenced by past compliance behaviour rather than following some predetermined schedule. However, the current study does not coincide with the result of finding out that companies quickly reverse their past compliance strategies, with good companies becoming more likely to violate and bad companies choosing to comply. It is suspected that the 4 banana farms may differ in terms of level of implementation but they are all governed by their commitment to protect the workers which are vital in the sustainability of the business operations.

This study also confirmed the effectiveness of Harrington's (1988) enforcement model wherein all business units that have been caught in the past will be inspected each day, and for those that never been caught will be selected at random to be inspected, which happened in Week 12.

Finally, as of Week 15-18 in the current study, it somehow confirmed that having been caught as non-compliant generally does not result in more compliance unless past violations increase future punishment. Though, there was no significant increase in fines, the corporate farms exhibited an increase of level of implementation in Week 17. It can be attributed to the corporate farms' natural response to the successive results of inspections because of the recurring findings on non-compliance.

V. RECOMMENDATION

Based on the results and discussions, the study recommends the following:

1. Regardless of the enforcement schemes presented in the foregoing, companies shall not rely on announced or predetermined schedule of monitoring. The enforcement strategy shall take into consideration the past compliance performance of business units.
2. The contexts of an organization shall be studied first by considering culture, management style, and organizational landscape. By doing so, a more relevant strategy may be implemented for people who respond more to punishment severity or amount of fine than to probability.
3. Apart from the financial consequences, there is a need to investigate the factors that contribute to "undercompliance" or noncompliance.

REFERENCES

[1] Anderson, L.R. & Stafford, S. L. (2006). Does Crime Pay? A Classroom Demonstration of Monitoring and Enforcement. Southern Economic Journal, 72(1), 4, 1016-1025.
[2] Barling, Julian & Frone, Michael R. (2004). The Psychology of Workplace Safety. Retrieved from https://www.apa.org/pubs/books/4316023
[3] Becker, G. (1968). Crime and Punishment: An Economic Approach. The Journal of Political Economy, 76(2), 169-217.
[4] Becker, G. S. and Stigler, G.J. (1974). Law Enforcement, Malfeasance, and the Compensation of Enforcers, Journal of Legal Studies, 3(1), 1-19.
[5] Harrington, Winston. 1988. Enforcement leverage when penalties are restricted. Journal of Public Economics, 37(1), 29-53.

[6] Hirose, Kenichi & Vitasa, Benjamin C. (2007). Implementation of the Labour Standards Enforcement in the Philippines, International Labour Organization, Subregional Office for South-Easte Asia and the Pacific Manila, Philippines.
[7] International Labour Organization (ILO): - Labour inspection (International Labour Conference) (2001) https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/occupational-safety-and-health/lang--en/index.htm
[8] International Labour Standards: Rules of the Game for the Global Economy: Rules of the Game (Revised Edition 2014), A brief introduction to Labor Standards.
[9] Mankiw, Gregory N. (2004). Principles of Economics. Retrieved from https://trove.nla.gov.au/work/19485014
[10] Sharp, A., Register, C., Grimes, P.(20th Ed) (2013) Economics of Social Issues. Chapter 9: Labor Disputes (pp. 264-265). McGraw-Hill Companies.