

Harmonization of Law in the Application of Legal Metrology

Muldri Pudamo James Pasaribu* and Ningrum Natasya Sirait

Law Program, Graduate School, University of Sumatera Utara, 20222 Medan, Indonesia

ABSTRACT

Indonesia is one of the members of the World Trade Organization that took part in ratifying the World Trade Organization Agreement on Technical Barrier to Trade (WTO-TBT) through Law Number 7 of 1994 on Agreement of Establishing the World Trade Organization (PWTO Law). In accordance with PWTO Law, Indonesia is required to implement the trade regulations, including technical infrastructures such as metrology. The objective of this study is to examine the harmonization of law in the field of metrology as a consequence of the WTO-TBT Agreement. This research applied a juridical normative and descriptive analysis method. The data were obtained by conducting a literature review. The study showed that the legal consequence of WTO-TBT on the metrology regulation had discovered the need to harmonize the Law Number 2 of 1981 on Metrology with various regulations. Many regulations and international organizations are involved since the establishment of WTO-TBT concerning accurate measurements in the field of metrology. In conclusion, the cooperation of various countries under the framework of the WTO obliges Indonesia to harmonize its trade and metrology law. Such harmonization should also cover the rules at a regional level.

Keywords: Harmonization, legal metrology, legal system, metrology law, international trade

INTRODUCTION

International trade is a cross-border buying and selling transaction, involving two parties from different countries who are both subject to different legal systems. The differences in the legal system can cause problems or difficulties in the transaction implementation. Different contents of the national laws applicable in the two countries have resulted in legal uncertainties and

ARTICLE INFO

Article history:

Received: 03 October 2019

Accepted: 12 March 2020

Published: 26 June 2020

E-mail addresses:

muldripasaribu73@gmail.com (Muldri Pudamo James Pasaribu)

ningrum.sirait@gmail.com (Ningrum Natasya Sirait)

* Corresponding author

difficulties among various business actors (Lopez-Rodriguez, 2002; Mandala, 2016).

Other problems often occurring in international trade include the addition of production costs. This is due to redundant testing and/or redundant certification for different national markets. Additional transportation costs can result from a product's failure to meet the requirements of importers. Furthermore, extensive and expensive inspection by an importing country may cause time and administration delay.

These problems show the importance of various trade agreements between countries in the world such as the World Trade Organization (WTO), the North American Free Trade Agreement (NAFTA), the ASEAN Free Trade Area (AFTA), the Asia-Pacific Economic Cooperation (APEC) and the European Union (EU).

The establishment of the ASEAN Economic Community (AEC) at the end of December 2015 was an important development in ASEAN. Earlier, in October 2003, the leaders of the ASEAN member countries agreed to endorse the ASEAN Economic Community towards the aspiration of "Many Countries, One Economy" by broadening the integration of regional economic. The main aim of the AEC was to accelerate action taken by AFTA to enlarge and more in depth the trade liberalization. It began with the implementation of "Preferential Trading Arrangement" that foster intraregional trade and broadened the economic field. Furthermore, it is to improve economic

relation with ASEAN's surroundings such as China, Japan, South Korea, and India by bilateral and collective free trade agreements (Habibullah et al., 2017)

Every country wants its national products, both goods or services, to be an international commodity that can move freely and is accepted throughout the world. On the contrary, every country also wants its domestic market not to be flooded with goods or services that could harm its national interests. World Trade Organization Agreement on Technical Barrier to Trade (WTO-TBT) is an agreement of all WTO member countries with the aim of maintaining a fair international market. Therefore, under the framework of WTO-TBT, each country is authorized to establish technical regulations to protect its domestic market. This regulation shall be transparent to all member countries and must be in accordance with international standards established by international standardization organizations.

The Indonesian Government has ratified the Agreement on Establishing the World Trade Organization (WTO) through Law Number 7 of 1994. As a result, the Indonesian Government is obligated to accept all international agreements within the framework of the WTO. One of the agreements is an agreement relating to the World Trade Organization Agreement on Technical Barrier to Trade (WTO-TBT).

Based on such regulations, countries intending to sell their products and services to other countries may undertake various necessary efforts to comply

with the technical regulations of their export destination. Compliance with the requirements of international standards adopted by the country's technical regulation will only be accepted if the declaration of conformity is provided by a competent assessment agency. In this case, a common reference measure is required between the transacting parties to create confidence in the conformity assessment results. The basic infrastructure to ensure the accuracy, reliability and traceability of measurement results in the International System of Units (*Système International d'Unités* or SI) which is internationally known as metrology infrastructure.¹

Metrology encompasses every conceptual and implementation factors of measurement. According to the International Vocabulary of Basic and General Terms in Metrology (*Vocabulaire International de Metrologie/VIM*), metrology is an activity that encompasses all the activities necessary to perform correct, traceable and truthful measurements at national, regional and international levels. Ultimately, it will be able to create mutual trust among those who do or have an interest in the measurement (Joint Committee for Guides in Metrology [JCGM], 2012).

Metrology is classified into three main categories with varying degrees of complexity and accuracy (Howarth & Redgrave, 2005):

(i) Scientific Metrology: Dealing with

the arrangement and development of its measurement and maintenance standards (highest level);

(ii) Industrial Metrology: Aiming at ensuring that measurement systems and measuring instruments in the industry function with sufficient accuracy, both in their preparation, production and testing processes;

(iii) Legal Metrology: Relating to measurements that impact economic, health, and safety transactions.

Legal metrology is set forth in Law Number 2 of 1981 concerning on Legal Metrology (*Undang-Undang tentang Metrologi Legal* [UUML]). This regulation is aimed at ensuring the correctness and legal certainty of measurement in the activities related to transaction justice, public health, environmental protection and safety (Badan Pembinaan Hukum Nasional [BPHN], 2013).

Almost all aspects of international trade are influenced by standards or regulations. However, such standards or regulations can become a technical barrier to trade (TBT), which can cause increased costs, hamper free goods flow, or require repeated testing, if there is no good measurement system. In facing the free market, Indonesia must be able to meet production and product quality requirements for international trade in accordance with international agreements and regulations. The role of metrology in national economic development, especially related to the trade sector, is through the harmonization of standards and technical

¹ Seven basic units: kelvin (temperature), second (time), meter (length), kilogram (mass), candela (light intensity), mol (amount of substance) and ampere (electric current), see Article 3 of UUML

requirements at the regional, bilateral, and international levels. Such harmonization will form the conditions of “One Standard-One Test-Accepted Everywhere”, because of which the flow of movement of goods and services in international trade will become easier and is expected to increase the confidence of the international community in Indonesia’s domestic products as well as increase the competitiveness of domestic products in the international market.

Legal metrology is an effective tool for market surveillance and should be used as a focus for strategies aimed at establishing fair trade (Ardianto, 2012).

Metrology is considered necessary because the current metrology system has become an internationally harmonized system. Furthermore, it serves as a basic infrastructure to facilitate global trade within the framework of the WTO-TBT. Indonesia has the TBT Agreement through Law Number 7 of 1994. This agreement promotes the establishment of mutual recognition of inter-state conformity assessment results.² The TBT Agreement acts to minimize technical barriers to trade related to technical regulations, standards and conformity assessment procedures.³ These three categories in metrology regulate the harmonization of free trade by using international standards in regulating symbols, packing, tagging or labelling applied to a product ensuring that domestic policies would not impede the ability of exporters to access local markets.

² Article 6 and Article 9 of WTO-TBT Agreement

³ Preamble of TBT Agreement

The present study was undertaken with the objectives to understand the legal consequences of the WTO-TBT Agreement on the Indonesian regulation especially in the field of metrology, and to know the harmonization of various regulations on legal metrology.

Formulation of the Problem

The problems of this study are defined to find out the legal consequence of the WTO-TBT Agreement on the regulation in the field of metrology, as well as how the law in the field of metrology is harmonized through the unification of the legal system.

Literature Review

Plato, in *The Timaeus*, spoke about the need for the good and the rationale to overcome “discordant and unordered motion,” thereby bringing about harmony. Yet in the theory of music, harmony has been understood as a simple “reconciliation of opposites, a fitting together of disparate elements,” and harmony is rather, here, a process of discovery, based on the “inevitable” order of notes and the place of music in the “cosmic pattern.” There are therefore different concepts of harmony in the world although, given different degrees and modalities of human intervention, there can be no clear line between them (Glenn, 2003).

The different concepts of harmony in law have been developed in different places and different circumstances, and it is important to place each of them in their historical contexts.

Harmonization in law includes the adjustment of laws and regulations, government decisions, judges' decisions, legal systems and legal principles with the aim of enhancing legal unity, legal certainty, justice and equality, the usefulness and clarity of the law, without obscuring and sacrificing legal pluralism (Gandhi, 1995).

As countries are becoming more connected, harmonization, mutual confidence, and recognition are becoming more necessary to facilitate trade (Ponce et al., 2006). Achieving international harmonization for legal metrology is the main objective of the OIML (International Organization of Legal Metrology). It can be partially achieved by exchanges of technical expertise, close collaboration with other international and regional bodies working in related fields, and international recommendations on related issues (Barker, 2005). OIML and the International Organization for Standardization are also considered as standardizing bodies in the sense of the Technical Barrier to Trade Agreement of the World Trade Organization (Just, 2009). The harmonization of international standards and procedures is an effective tool for reducing asymmetries in international trade scenarios (Ticona & Frota, 2008).

The harmonization of the international legal system is harmonizing the plurality of the legal system in the international legal system, to establish uniformity in the legal system that can be accepted by all countries carrying out international trade transactions. They are formulated

in two steps: adjustment of the national legal system into a global legal system to harmonize law, and the adjustment of certain legal norms into a unity of global norm which can later be used as means of dispute resolution, to harmonize and uniform judges global decisions.

The international harmonization of regulations may be a great issue to facilitate the growth of the global market, and initiatives like the Mutual Acceptance Arrangement are tracing a way to move past technical barriers. Once international trade is related to government politics and not metrological issues, however, the developments in international trade metrology may include partnerships between OIML and the World Trade Organization (Rodrigues Filho & Gonçalves, 2015).

MATERIALS AND METHODS

This research applied a juridical normative and descriptive analysis method. The data were obtained by conducting a literature review, whose data sources were secondary data, consisting of primary legal materials, secondary legal materials, and tertiary legal materials (Amiruddin & Asikin, 2004). The method used was a holistic normative legal method (Soekanto & Mamuji, 2004). The data was analyzed using a comparative approach by conducting a comparative law study focused on legal theory approach. It compared legal systems to find similarities and differences (Soeroso, 2005). The degree of comparability of the object may vary depending on legal aspects, legal structure, legal function or legal consequences.

RESULTS AND DISCUSSIONS

Legal Consequences of WTO-TBT Agreement against Metrology Regulation

The endorsement of establishing the World Trade Organization (WTO) is the culmination point of a series of previous negotiations, which were also intended to include some existing agreements during the Uruguay Round. According to Trebilcock, the Uruguay Round produced two new agreements as the elaboration of the Standards Code of the 1979 Tokyo Round (Trebilcock & Howse, 1999), namely The Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) and The Technical Barriers to Trade Agreement (TBT Agreement). Both agreements are unified and complementary. While the SPS Agreement is designed to provide protection for ecological and environmental life, the TBT Agreement accommodates technical standard provisions which are not regulated in the SPS Agreement. The TBT Agreement provisions work through three concepts that are not contained in the SPS Agreement, namely technical regulations, standards, and conformity assessment procedures applicable to all products.

TBT Agreement applies to all products, including industrial and agricultural products, but does not include SPS measures. It covers technical regulations, standards and conformity assessment procedures, as defined in Annex 1 of the Agreement (Trebilcock & Howse, 1999).

However, the requirements mentioned above cannot be implemented in synergy

with the Legal Metrology Law (*Undang-Undang tentang Metrologi Legal* [UUML]). The long-time span between UUML Law (issued in 1981) and PWTO Law (issued in 1994) is one of the causes. As a matter of fact, the ratification of the TBT Agreement has affected the external and internal law of Indonesia. The effect on the external law is that through such action, Indonesia has accepted all the obligations imposed by the intended international agreement. Meanwhile, the effect on the internal law is the obligation for Indonesia to amend its domestic law in accordance with the provisions of the intended international agreement (Brotosusilo, 1996).

As a legal consequence of being a member of the World Trade Organization (WTO), Indonesia has adopted the norms of international standardization since the issuance of Government Regulation Number 102 of 2000 on National Standardization which was reaffirmed in Law Number 7 of 2014 on Trade. Allocation of norms, rules, processes and institutional standardization, technical regulation and conformity assessment according to the Agreement on Technical Barrier to Trade have been transformed into a national trade regulation. Legal transformation is a key element in the process of globalization that occurs directly from the existence of a network of local globalization and global localization.⁴

According to Annex 3 of TBT Agreement, standards are addressed by the TBT Agreement in a separate Code of Good Practice for the preparation, adoption and

⁴ Article 59 of UUP

application of standards. The implication on formulating law and policy in Indonesia is the national standard shall be harmonious with the international standards.

The next period in the trade regulation development is the enactment of Law Number 7 of 2014 on Trade (*Undang-Undang tentang Perdagangan* [UUP]) and Law Number 20 of 2014 on Standardization and Conformity Assessment (*Undang-Undang Standarisasi Penilaian dan Kesesuaian* [UU] SPK). Both of the laws regulate Standardization and Conformity Assessment, which means that the regulation of standardization and conformity assessment sourced from the TBT Agreement has been incorporated into the regulation which is the result of legislation decisions in Indonesia (Chandrawulan, 2011).

In addition to the WTO requirements on the equivalence of the inter-state conformity assessment system, OIML⁵ requires acceptance of the conformity assessment system as stated in the OIML B 10-1 document: 2004 International Organization of Legal Metrology-Mutual Acceptance Arrangement (OIML - MAA).⁶ From the requirements stated in Article 6 and 9 of the TBT Agreement and the requirements stated in OIML B 10-1 above, Indonesia meets the mutual acceptance requirements of the accreditation system. This is coordinated regionally by APLAC

⁵ International Organization of Legal Metrology, French: *Organisation Internationale de Métrologie Légale*

⁶ 4.6.1...Declaration of Mutual Confidence as, for example, participation in the ILAC MRA ("International Laboratory Accreditation Cooperation-Mutual Recognition Arrangement").

(Asia-Pacific Laboratory Accreditation Cooperation) and internationally by ILAC (International Laboratory Accreditation Cooperation).⁷

The international requirements mentioned above indicate that one of the important conditions in the TBT Agreement is the acceptability of the conformity assessment system based on the agreed criteria in regional and international accreditation cooperation organizations. The essential requirement to achieve the acceptability of the conformity assessment system is the measurement traceability to a national metrology institution (LMN: National Metrology Institute). This institution meets the requirements set forth by BIPM through the CIPM MRA scheme (International Committee for Weights and Measures).

Furthermore, although the Indonesian government has not been able to amend the UUML immediately, it must keep on trying to harmonize with various regulations and international rules in the field of legal metrology. Thus, trading activities are not hampered and still conducted properly.

Harmonization of Law in the Field of Metrology through the Unification of the Law System

When legal systems interact with each other as legal resources, there is a high probability of changing circumstances in which laws and cases are used in equal measure and

⁷ APLAC MRA (Mutual Recognition Arrangement): Asia-Pacific cooperation in the field of laboratory accreditation; ILAC MRA: International cooperation in the field of laboratory accreditation

are even seen as equally authoritative (De Cruz, 2016). There is as yet little discussion about how globalization relates to legal theory and understandings of law. In common parlance, the term creates assumptions about the desirability of increased efficiency in processes of global communication. Immediately, things come to authors' mind, which are easier travel, homogenization of trade laws and harmonization or integration of all kinds of rules, easing communication processes by recourse to one language, one pattern of doing business, and so on. This is matched by the tempting assumption that there would be less conflict if only all humans thought alike, followed uniform moral standards and respected universal human rights (Menski, 2006).

Legal concepts of convergence, harmonization and unification have become increasingly evolving concepts especially in comparative studies of law. Such legal concepts can be generally understood as contained in Table 1.

Globalization leads to the convergence of the legal order or the legal system. Legal and economic experts have predicted that the implications of globalization will force

the legal order to converge in order to achieve economic efficiency. This is because the relevant regulatory order of a legal order will make a single legal system unlikely to provide optimal solutions to emerging problems (Budhijanto, 2011; Ogus, 1999).

Although convergence in some respects is possible, striking differences in ideology, political attitudes, social and economic policies must first be reconciled with one another. Massive integration is certainly not a prospect that can be predicted to happen in the future. However, a preliminary effort in the alignment of elements of different systems has begun in the European Union context (De Cruz, 2016).

Along with the globalization in the field of trade, various unification and harmonization efforts of international trade law have taken place. Many international organizations facilitate this process formally and informally. The method or approach used to realize the unification and harmonization of trade law have been diverse or pluralist (Mandala, 2016).

Goode (2010) mentioned several methods of harmonizing the law in more detail. Such methods include, for example, multi-lateral conventions that do not intend

Table 1
The legal concept of comparison

Legal Concept	General Understanding
Convergence	Used as an effort to unify legal systems, conceptions, principles, or norms
Harmonization	Used as an attempt to prepare a national law or state law that has regulatory linkages based on laws, regulations and administrative measures
Unification	Used as an effort to extremely harmonize both the difference and flexibility in the regulation and does not give space to other provisions

Source: Garoupa and Ogus (2006)

to create legal uniformity; international convention intended for the purpose of legal uniformity; bilateral agreements; directive (form of regulation for European Union) model law; codification of customary law; international trade rules established by non-governmental international organizations; contract model; and restatement of the principles of law by scholars and experts.

Various models of legal harmonization approach and various actors involved in legal harmonization today are extremely different from the conditions at the beginning of harmonization of law a century ago. The development in law harmonization efforts is not only about the increasingly diverse approach model but also the involvement of a number of organizations, both governmental and non-governmental organizations (Faria, 2009).

At the international level, legal metrology activities are coordinated by OIML. This coordination serves to improve the harmonization of global legal metrology requirements with the aim of developing a worldwide technical structure. Achieving the harmonization of the global measurement system can be illustrated in Figure 1.

Refer to Figure 1, to obtain one global measurement standard requires the following conditions:

- (i) The WTO and the OIML are responsible for harmonized legal regulations;
- (ii) ISO and IEC for harmonized standards;
- (iii) The CIPM for traceability to the SI; and
- (iv) ILAC and IAF for the competence of test laboratories and certification bodies.

The international agencies dealing with the elements shown above together with the national-level agencies in Indonesia can be described in Table 2.

Based on the figure and description above, the involvement of various global organizations achieves a global measurement system. Such organizations do not come from the countries with a similar legal system which, therefore, require absolute harmonization in the field of metrology and measurement. There is a harmonization of national regulation in the field of legal metrology; a harmonious standard in non-regulatory metrology;

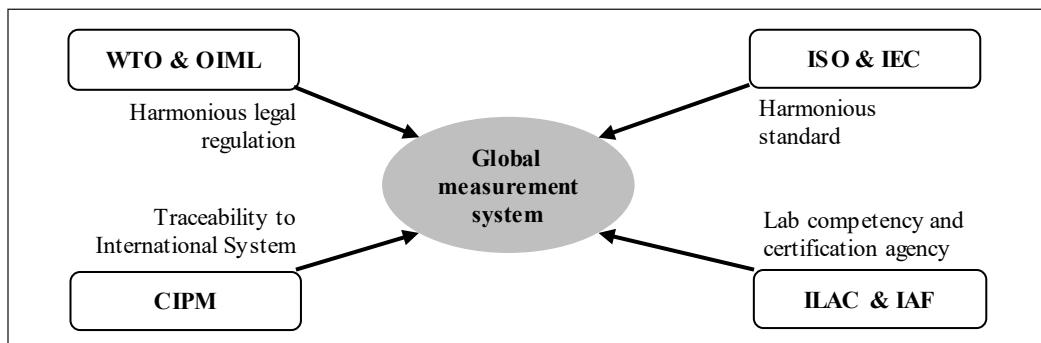


Figure 1. Global Measurement System

Table 2
Measurement system elements

Elements	International	National	Asia
Harmonious regulation	WTO/OIML	Directorate of Metrology-Ministry of Commerce	APLMF
Harmonious standard	ISO & IEC	BSN	
Traceability/ Recognition of measurement results	CIPM	KIM-LIPI Research Center	APMP
Lab Competency	ILAC/IAF	KAN	APLAC

Source: Badan Pembinaan Hukum Nasional (2013)

international recognition of traceability of measurement results to SI; and, international harmonization for required competencies of laboratory and certification agencies.⁸

TBT Agreement indirectly requires national technical regulations in the field of metrology to be transparent and non-discriminatory for all parties involved in commercial transactions. This can be realized only if the trade agreement is based on the harmonized standards or, if possible, the same standards. These standards can be used by certification agencies and testing laboratories to issue conformity certificates. ISO and IEC are international organizations that issue such standards. OIML, for about 50 years since its establishment, has also contributed to the harmonization of requirements and testing procedures in the field of legal metrology.

Until today, Indonesia has not made any change to achieve a harmonization

of law that ensures legal certainty in the field of metrology. The factors inhibiting such harmonization include a National Metrology Institute which has not yet been formed, the limited scope of UUML, inadequate technology, lack of qualified human resources and government’s low response to the urgency of harmonizing this regulation.

As the realization of legal metrology implementation, each OIML member state should have a national metrology institute whose duties include realization, maintenance, and dissemination of international recognition of National Standards of Measures (SNSU). In Indonesia, however, this task is currently carried out simultaneously by three institutions, i.e. the Directorate of Metrology (DM), the National Standardization Agency (BSN), and the Research Center for Calibration, Instrumentation, and Metrology of Indonesian Institute of Sciences (KIM-LIPI), resulting in tug of war among them. The Directorate of Metrology operates under the Ministry of Trade, while BSN and KIM-LIPI are institutionally under the Ministry of Research and Technology. Each institution has the task of drafting

⁸ List of abbreviations in the table: APMP: Asia Pacific Metrology Program; BSN: National Standardization Body; IEC: International Electrical Commission; KIM-LIPI: Research Center for Calibration, Instrumentation, Metrology; KAN: National Accreditation Committee; ISO: International Organization for Standardization; APLMF: Asia Pacific Legal Metrology Forum; IAF: International Accreditation Forum

and formulating national policies. The absence of a specific agency managing these measurement standards makes it difficult for Indonesia to participate in the cooperation framework of CIPM-MRA (Mutual Recognition Arrangement of the International Committee of Weight and Measures). According to Section 1.4, CIPM-MRA stated, "Each signatory to this arrangement is the national metrology institute designated by the appropriate national governmental or other official authority of the Member State of the Metre Convention as being responsible for national measurement standards. For any state that has more than one such designated institute, the arrangement is signed by one institute on behalf of all, the names of the other institutes being attached to the document." This means that the signing can only be done by one institution.

Substantially, the scope of the Legal Metrology Regulation focuses more on legal metrology from the trade sector only. Meanwhile, the protection of public interests related to measurement does not only become a fundamental requirement in trade practices, but it also includes aspects related to health, safety, security, and environment (HSSE). The implication of this condition (where the regulation applies only to legal metrology) indicates that Indonesia's involvement in various international organizations is only limited to APLMF and OIML. In other words, Indonesia's involvement in such metrological forums as APMP (Asia Pacific Metrology Programme) and BIPM (*Bureau International des*

Poids et Mesures or International Bureau of Weights and Measures) has no legal umbrella. Although in practice, Indonesia is represented by KIM-LIPI in the APMP and BIPM forums, the existing laws and regulations do not underlie Indonesia's participation.

Outdated and insufficient instruments to serve all existing measurement outfits clearly describes the condition of the facilities nationally in Indonesia, including buildings, equipment, operational vehicles, and size standards. Each provincial technical implementation units (PTIU) requires at least three sets of size standards for minimum calibration services that are well tracked. In addition, limited human resources also become obstacles to the administration of legal metrology. Nationally, 3,444 calibration officers are needed; meanwhile, currently, the number of calibration officers is only 787 people (22.9% of the ideal number of calibration officers). The obstacle in increasing the number of calibration officers is due to the difficulty of obtaining qualified human resources who hold legal metrology qualifications (Bachelor of Engineering).

Within a year, the PTIU can only provide services between 32-48 days for all districts/cities. The range of calibration/recalibration services is only 46.28% of the estimated population of measuring instruments. With the service range of only around 46.28%, a market can only be served once every three years. This condition occurs due to a lack of budget and planning for service procedures, especially in traditional markets.

In a regional context, the ASEAN Economic Community, established in 2015, encourages its member states to continue improving metrological provisions at the regional level. ASEAN is currently conducting capacity building cooperation for legal metrology authorities in each ASEAN member state through training activities in the field of legal metrology and laboratory intercomparison among the ASEAN member states. The cooperation contained in the ASEAN Consultative Committee for Standards and Quality (ACCSQ) Working Group on Legal Metrology (WG3) aims at harmonizing legal metrology in ASEAN to support the ASEAN Free Trade Area (AFTA) and to ensure that the modernization of legislation in the field of legal metrology by ASEAN member states does not result in new technical barriers to trade. In the previous ACCSQ meetings, ASEAN countries were recommended to consider the improvement of their national law and its derivatives. Some ASEAN countries have already implemented good regulations up to the international level, but some need intensive improvement and must be harmonized temporarily (Kochsiek, 2015).

In its latest development, the ACCSQ WG3 held a meeting in Yogyakarta, Indonesia on Thursday, October 25, 2018, attended by 24 delegates from Indonesia, Thailand, Malaysia, Cambodia, Laos, Vietnam, Singapore, the Philippines, the ASEAN Secretariat, and the Physikalisch-Technische Bundesanstalt (PTB) of Germany. The meeting discussed the need

for harmonization of policies in the field of legal metrology among ASEAN countries. Harmonization includes the development of technical legal metrology policies implemented in the ASEAN region, the development program in the field of legal metrology, and the exchange of information among ASEAN countries. This effort is expected to be able to bridge the differences in the legal system applicable in the ASEAN countries. Thus, technical barriers to trade are no longer a problem. Indonesia with its civil law system, for example, will eventually be able to easily conduct trade relations with Singapore or Malaysia which applies a common law system.

The need for harmonization of measurement standards arises as a result of the adoption of the results of the 1875 Meter Convention. All these Organizations had for objective to set up (by consensus) mechanisms for regulation in fields in which countries previously acted individually: international relations (UNO), health (WHO), alimentation (FAO), development (UNDP, OECD), finance (IMF), trade (GATT then WTO), etc. The OIML's objective is to contribute to setting up a Global Measurement System.

Everything could have continued to progress within the OIML, as in other Organizations, in a steady and foreseeable way. Based on the legitimacy of states and on their competence, the OIML developed model regulations on the basis of which the Member States would voluntarily harmonize their national regulations and recognize each other's measuring

instruments and measurement results. In this way, the dialogue between states would have been a simple way to provide the intended regulations. In the future, it will be necessary to improve the implementation of the obligations specified in the OIML Convention, and to make sure that these obligations are taken into account by the Regional Organizations as well as by the local authorities.

An example of relations between regional structures and Intergovernmental Organizations must be noted. In the World Trade Organization, the members are states. However, the members of the European Union decided to delegate their powers in negotiations as well as their votes, to the European Commission. This is a very efficient way to better involve a Regional Organization in international work, and benefits at the same time the Regional Organization, its Members and the International Organization. This shows that establishing links between an International Organization and a regional structure is not only the task of the International Organization but also that of the participating states. The development of relations between the OIML and Regional Organizations will not be done against the Member States' will, but in harmony with them (Magaña, 2002).

Therefore, an in-depth study on economic loss is needed because if it is not immediately conducted, the harmonization problem will impact the Indonesian economy. Harmonization can be proposed through the Ministry of Commerce which should be responsible for this case.

In such a perspective, the steps to achieve harmonization in the law of legal metrology can be done in two formulation steps: they are harmonization of formulation policy (regulatory system), and material harmonization (substance). The first point refers to the step of formulating the harmonization of its legal system, and the second point refers to the step of formulating the harmonization of norms (legal matter).

The ideal step taken in the harmonization of the legal system is necessary to make adjustments to the elements of the legal order applicable within the framework of the national legal system which includes the legal substance, along with its legal structure and legal culture component (Friedman, 1975).

CONCLUSIONS

In the field of legal metrology, many organizations from different countries must agree on global measurement standards to achieve cooperation in the field of trade. As a country taking a part in the ratification of the WTO-TBT, Indonesia accepts all liabilities charged and is also obligated to amend its domestic law in accordance with the provisions contained in that agreement. Open international trade demands uniformity between the rules applicable at the international level and the rules made at the national level. The uniformity of this rule is commonly referred to as harmony between international rules and national rules. In the harmonization of law, the most important point is the meeting point of the fundamental principles between the two,

thus avoiding the occurrence of conflict of law. Disharmonized of the legal system will bring up a situation that cannot ensure a legal certainty which can cause disruption in the social life, disorder the sense of vulnerability. In such a perspective the problem of legal certainty will be perceived as a need which can only be realized through the harmonization of the legal system. The challenge for OIML as it is an outstanding challenge for all standardization bodies are new information technologies will be widely used and new working methods will have to be implemented. It is necessary to raise the awareness of political decision-makers in all countries, as well as the awareness of development agencies so that they seriously take metrology into account in their programs. The findings suggest the government of Indonesia to amend Law No. 2 of 1981 concerning Legal Metrology immediately. This improvement is expected to accommodate and simultaneously provide solutions to the problems of international trade barriers. It is also necessary to raise the awareness of the public as to the role of metrology and legal metrology. Furthermore, the legal certainty on legal metrology will be able to encourage economic activities and become an effort to improve the welfare of the people of Indonesia.

ACKNOWLEDGEMENT

Special thanks to the IMHA 2018 committee members and UPM Pertanika Journal team, which have assisted to publish this article.

REFERENCES

- Amiruddin, & Asikin, Z. (2004). *Pengantar metode penelitian hukum* [Introduction to legal research methods]. Jakarta, Indonesia: Raja Grafindo Persada.
- Ardianto, R. (2012). A way to stimulate public awareness. *OIML Bulletin*, *LIII*(2), 33-38.
- Badan Pembinaan Hukum Nasional. (2013). *Academic manuscript of amendment of law number 2 of 1981 on legal metrology*. Jakarta, Indonesia: Pusat Perencanaan Pembangunan Hukum Nasional BPHN.
- Barker, J. (2005). The OIML and the purpose of international recommendations. *Accreditation and Quality Assurance*, *10*(3), 123-124.
- Brotosusilo, A. (1996). Dampak yuridis, pertimbangan ekonomis dan cakrawala sosiologis, ratifikasi "Agreement establishing the world trade organization/WTO" oleh Indonesia [Juridical impact, economic considerations and sociological horizons, ratification "Agreement establishing the world trade organization/WTO" by Indonesia] . *Jurnal Hukum dan Pembangunan*, *XXVI*(2), 97 – 124.
- Budhijanto, D. (2011). Pembentukan hukum yang antisipatif terhadap perkembangan zaman dalam dimensi konvergensi teknologi informasi dan komunikasi [The formation of laws that are anticipatory to the times in the dimension of convergence of information and communication technology]. *Jurnal Ilmu Hukum*, *14*(2), 225-255.
- Chandrawulan, A. A. (2011). *Hukum perusahaan multinasional, liberalisasi hukum perdagangan internasional dan hukum penanaman modal* [Multinational company law, liberalization of international trade law and investment law]. Bandung, Indonesia: Alumnus.

- De Cruz, P. (2016). *Perbandingan sistem hukum [Comparison of law system]: Common law, civil law, and socialist law*. 5th Edition. Bandung, Indonesia: Nusa Media.
- Faria, J. A. E. (2009). Future directions of legal harmonisation and law reform: Stormy seas or prosperous voyage? *Revue de Droit Uniforme*, 5(5), 5 – 34.
- Friedman, L. M. (1975). *The legal system: A social science perspective*. New York, USA: Russell Sage Foundation.
- Gandhi, L. M. (1995). *Harmonisasi hukum menuju hukum yang responsif. Makalah, yang disampaikan pada pidato pengukuhan guru besar tetap FH-UI [Harmonization of law towards responsive law. A paper, delivered at the inauguration speech of the permanent FH-UI professor]*.
- Garoupa, N., & Ogus, A. (2006). A strategic interpretation of legal transplants. *The Journal of Legal Studies*, 35(2), 339-363.
- Glenn, H. P. (2002). North America as a medieval legal construction. *Global Jurist Advances*, 1(1), 49 – 60.
- Glenn, H. P. (2003). Harmony of laws in the Americas. *University of Miami Inter-American Law Review*, 34(2), 223.
- Goode, R. (2010). *Commercial law* (4th ed.). London, England: Penguin.
- Habibullah, M. S., Chong, C. Y., & Din, B. H. (2017). Developing and developed ASEAN-10 economies: Converge or diverge? *International Journal of Economics and Management*, 11(S3), 623-640.
- Howarth, P., & Redgrave, F. (2005). *Metrology in short* (2nd ed.). Denmark: MKom Aps.
- Joint Committee for Guides in Metrology. (2012). *Basic and general concepts and associated terms (VIM)* (3rd ed.). Sèvres, France: JCGM-BIPM.
- Just, S. (2009). The memorandum of understanding between ISO and the OIML. *OIML Bulletin*, L(2), 40-41.
- Kochsiek, M. (2015). Legal metrology prepared for the ASEAN economic community. *OIML Bulletin*, LVI (2), 36-38.
- Lopez-Rodriquez, A. M. (2002). Lex mercatoria [The law merchant]. *Retzvidenskabeligt Tidsskrift*, 2(2), 46-56.
- Magaña, J. F. (2002). How will the development of regional authorities and local authorities affect intergovernmental organizations such as the OIML? In *Proceeding OIML Seminar* (pp. 21 – 28). Espace Olano Saint-Jean-de-Luz, France: International Organization of Legal Metrology.
- Mandala, S. (2016). Harmonisasi hukum perdagangan internasional: Sejarah, latar belakang dan model pendekatannya [Harmonization of international trade law: History, background and model of approach]. *Jurnal Bina Mulia Hukum*, 1(1), 53 – 61.
- Menski, W. (2006). *Comparative law in a global context: The legal systems of Asia and Africa* (2nd ed.). New York, USA: Cambridge University Press.
- Ogus, A. (1999). Competition between national legal systems: A contribution of economic analysis to comparative law. *International and Comparative Law Quarterly*, 48(2), 405-418.
- Ponce, J., Hebert, M., Schmid, C., & Zisserman, A. (2006). Toward category-level object recognition. Retrieved 25 July 2017, from https://www.researchgate.net/publication/238720169_Toward_Category-Level_Object_Recognition

- Rodrigues Filho, B. A., & Gonçalves, R. F. (2015). Legal metrology, the economy and society: A systematic literature review. *Measurement* 69: 155–163.
- Soekanto, S., & Mamuji, S. (2005). *Penelitian hukum normatif* [Normative legal research]. Jakarta, Indonesia: Raja Grafindo Persada.
- Soeroso. (2005). *Perbandingan hukum perdata* [Comparison of civil law]. Jakarta, Indonesia: Grafika.
- Ticona, J. M., & Frota, M. N. (2008). Assessment of the economic impact of product certification: A significant area of application of measurement, *Measurement* 41(1), 88-104.
- Trebilcock, M. J., & Howse, R. (1999). *The regulation of international trade* (2nd ed.). London, England: Routledge.