

# Thai -Journal Citation Index (TCI) centre: 10 years of experiences, lessons learned, and ongoing development<sup>\*</sup>

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## ABSTRACT

*This paper outlines 10 years of experiences concerning the inception and operation of the Thai-Journal Citation Index (TCI) Centre, which was the first national citation centre in Thailand and also in the Association of Southeast Asian Nations (ASEAN), founded in 2001. The experiences discussed involve the aims and missions of the TCI towards improving the quality and increasing the visibility of local and national research findings. The impacts of the TCI on the academic community are also described, together with the challenges faced in regard to its acceptability, especially by internationally oriented researchers. Various TCI activities to promote and disseminate national research findings are discussed, such as a quality assessment program for Thai journals indexed in TCI, awarding high-quality Thai journals, launching the Thai Journal Online (Thai-JO) system, and identification and comparison of local research performances using TCI and international databases as data sources. Finally, the ASEAN Citation Index (ACI) database is introduced, as part of the preparation for the ASEAN Economic Community (AEC) in conjunction with the TCI and other national citation index databases, in order to enhance the dissemination and quality of ASEAN research profiles on an international platform.*

**Keywords:** National citation index database; Research performance evaluations; Thai-journal Citation Index (TCI) database; ASEAN Citation Index (ACI); National Citation Centre.

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## **ESTABLISHMENT AND MISSIONS OF THAI-JOURNAL CITATION INDEX (TCI)**

Journals are one of the key media for both national and international scholars to communicate and exchange their academic research discoveries, without them having to meet or personally know each other. Before 2001 and the establishment of the Thai-Journal Citation Index (TCI) Centre, Thai journals were published mostly by government offices and universities, as well as professional associations and other independent offices, with the objective of publicizing articles written by their own staff and officers in order to apply for academic promotions and awards. Most Thai journals were published and distributed behind their expected and pre-assigned schedules, and were sometimes unable to sustain continued publication. This is because publication was very much dependent on their officers' requests, executive policies, and budgets allocated. In addition, the peer-review process was relatively weak as compared to international journals. Most importantly, there was no evidence to confirm how many articles published in Thai journals had been used or cited by other researchers. If cited, most citations were self-citations. These were the major reasons behind the establishment of the TCI Centre. The main aim was (and is) to encourage the quality development of Thai journals, and to disseminate research findings for social and community benefits. To achieve this aim, a sustainable and comprehensive searching system for retrieving published articles and their citations has also been developed. No citation index centre similar to this had been launched in Thailand before the year 2001, when the TCI was unofficially established.

However, literature reviews indicate that there were Chinese national citation databases (Jin and Wang 1999; Jin et al. 2002) that had been established since 1989 called as the Chinese Science Citation Database (CSCD), which was supported by the Natural Sciences Foundation of China (NSFC). In the initial stage, the CSCD covered only 315 journals published in China and expanded to 582 titles in 1996 and 1064 titles in 1999, focusing only on science and technology journals in China. Together with the CSCD, there was also another database, "China Scientific and Technical Paper and Citations database (CSTPS)", which was dedicated for the purpose of research performance evaluations of China's scientists and engineers (Wu et al. 2004; Jin and Rousseau 2004). This database was established as a result of the small number of Chinese journals covered by the Science Citation Index (SCI), and this was claimed to be the first non-English science citation database in the world. In 1998, the Chinese Social Science Citation Index (CSSCI) was developed to cover over 500 scholarly Chinese journals in the humanities and social sciences (Xin-ning et al. 2001).

The Thai-Journal Citation Index Centre, or TCI, was first introduced publicly via a research project in 2001, financially supported by King Mongkut's Institute of Technology Thonburi (KMUTT). The project, entitled "Assessment of Citation Impact Factor Indexes for Thai Academic Journals", was written by Professor Narongrit Sombatsompop, the founder of the TCI, and his colleagues who gathered the publication and citation data of articles published by Thai journals, and also calculated the Journal Impact Factor (JIF) value of 68 Thai academic journals. The results showed that the average two-year journal impact factors for all journals used was only 6.9, meaning that for every 100 published articles there would be a total of 6.9 citations (Sombatsompop 2002). In addition, during the study, some interesting qualitative observations regarding the publication and citation behaviors of Thai journals were listed and discussed as follows:

- a) There were no Thai citation databases to collect Thai and locally written articles. No citations of any published articles were recorded and were able to be retrieved.
- b) Too many Thai journals were published by too many organizations, e.g. by almost every university, and some were published by academic faculties and departments. This resulted in a narrow academic content being published within a particular journal, and thus no citations were obtained.
- c) Most published articles had never been cited, and if they were, most citations were self-citations.
- d) The major aim was to publish and disseminate an organization's (university, faculty, etc.) own staff papers for their own academic promotion.
- e) Most Thai journals did not have a strong peer-review process (internal review by colleagues from the same institutions, or by the editor alone), and some had no peer review whatsoever.
- f) Most journals could not publish articles in a timely manner due to low submission rates and no systematic and effective review process.
- g) There were multiple presentation formats and referencing styles in one journal.
- h) No journal evaluation processes had ever taken place for Thai journals, and thus no quality assurance was in evidence.
- i) No funding organizations had ever used local publications and citations for research grant reviews and budget allocations.
- j) There had never been any symposia or conferences for journal editors to meet and share their publishing or editorial experiences.

As a result of the above observations, the Thailand Research Fund (TRF) in cooperation with KMUTT officially established, for the first time in Thailand, the Thai-Journal Citation Index Centre on July 1, 2004, with the aims of setting up databases for searching publications and citations in Thai academic journals, and of reporting the journal quality index of Thai academic journals on a yearly basis. At that time, most of the indexed journals focused on science and technology. In 2008 the TCI Centre, in collaboration with Thammasat University Libraries led by the Director of the Thammasat University Library, indexed the publications and citations from humanities and social sciences journals.

At present, the TCI Centre is responsible for five major missions, as follows:

- a) Collecting published articles and citations for Thai journals, and developing search and retrieval tools in the form of a sustainable TCI database. The number of indexed journals appears to have increased over time. In Thailand, there are about 1,000 journals, but only 45% have been indexed in the TCI database.
- b) Reporting the Thai-journal impact factors on a yearly basis, in the same way as those provided by Thomson Reuters. It has been found that the number of journals having journal impact factors, and their average value, has increased with time. One of the causes is related to the increase in the number of journals in the database as well as the citations received. This indicates a benefit of having the TCI Centre; researchers are able to search Thai articles, whereas this was not possible in the past.
- c) Conducting scientometrics research on related issues, and publishing research articles regularly in both national and international journals. Since the TCI members are researchers, works are regularly published in renowned international journals. Examples of research works conducted by the TCI Centre are "A modified

method for calculating the impact factors of journals in ISI Journal Citation Reports” (Sombatsompop 2004), “Making an equality of ISI impact factors for different subject fields” (Sombatsompop 2005), “Categorization and trend of materials science research from Science Citation Index (SCI) database”(Sombatsompop 2007), “Relationship on research publications and productivity-export volumes for natural rubber” (Sombatsompop 2009), “Research performance evaluations of Thailand National Research Universities during 2007–2009” (Sombatsompop 2010), and “Research productivity, impact and excellence of ASEAN countries and universities using standard bibliometric analysis: a case study of energy and fuel field” (Sombatsompop 2011).

- d) Providing academic and social services as well as training and consultancy on how to improve journal quality across the country. TCI also organizes an annual national symposium for about 250 Thai editors to meet with each other, free of charge and has organized six national symposia.
- e) Seeking partnership with related organizations – locally, regionally and internationally – in order to exchange experiences on how to develop Thai journals and increase the visibility of research findings in Thailand in the academic community throughout the region and around the world.

### **Contributions and Impacts of TCI in the Improvement of Journal Quality and Research in Thailand**

The TCI database is considered a new dimension of the academic journal community in Thailand, as it was the first and only citation database in the country. The TCI gathers and records information from academic journals published in Thailand that meets the requirements of the TCI Centre regarding science and technology, as well as humanities and social sciences. The numbers of journals in the TCI database have continuously increased, from 100 in 2002 to 480 in 2012 (as of March 24, 2012). The TCI database includes information on publications, citations, and detailed policies and management systems of the indexed journals that can easily be searched at <http://tci.trf.or.th>. This is the first time in Thailand that citations of articles in Thai journals can be searched. In addition, the TCI database is widely recognized in domestic academic journals, as evidenced by the fact that the editors of various journals have mentioned in their editorial sections that the journals are now indexed in the TCI database, and have received TCI Journal Impact Factor (T-JIF) values. Below are the summaries of the contributions and impacts of the TCI database that have led to significant quality improvements of Thai journals as well as overall research in Thailand.

#### **i) Setting out Quality Criteria for Thai Academic Journals**

One of the immediate benefits of establishing the TCI Centre was that Thailand would have its own online database, containing not only bibliographic records of journal articles but also the citations. In addition to that, many government offices and public companies could use the TCI database to evaluate quality and calculate weights of academic articles in Thai journals; for example:

- a) The Office for National Education Standards and Quality Assessment (Public Organization) (ONESQA) has developed indexes and criteria of external quality assessment at a tertiary level (B.E. 2544–2558) for the quality of published research articles. The quality level of research articles indexed in the TCI database has been given more weight than those outside the database. For example, articles published in journals indexed in the TCI will have a weight of 0.75 (compared to a weight of 1.0 for articles published in international journals indexed in Thomson

Reuters and Scopus) (The Office for National Education Standards and Quality Assessment 2011).

- b) Research quality assessment of Thai higher education institutions supported by the Thailand Research Fund (TRF) has used quality assessment criteria to evaluate research articles published in journals, with an average T-JIF value for the past 3 years (from the TCI database) of no less than 0.025, to be equivalent to a weight of 0.50 (compared to a weight of 1.0 for articles published in international journals indexed in Thomson Reuters and Scopus). Journals with lower T-JIF than 0.025, or those outside the TCI database, have lower weights (The Thailand Research Fund 2010).
- c) Other higher education institutes (mainly universities) have extensively used information from the TCI database to set up funding and honorarium policies based on publication in international and TCI databases. Those universities include Thammasat University, Walailak University, Chulalongkorn University, and Thaksin University.

## **ii) Assessment and Classification of Thai Journals based on Quality**

Since its establishment, the TCI Centre sponsored by TRF has aimed at evaluating and developing the quality of Thai academic journals, both in content and format, in order to meet international standards. Journals to be considered and included in the database must meet the following criteria:

- a) All articles must be peer reviewed by external reviewers outside the institutions that publish the journal.
- b) Journals must be distributed on schedule as specified by the journal publication policy.
- c) The publication age must be no less than 3 years.
- d) Articles published in the journals should be cited, and able to be searched from either the TCI or international databases.
- e) Conditions and formats of journal publication must be clearly specified.
- f) Journals should have a good diversity among editorial board members. This means that at least 50% of the board members should be invited from outside the institutions that publish the journal.
- g) Journals must have a good diversity of authorship. This means that at least 50% of the articles should be written by authors outside the institutions that publish the journal.
- h) All articles must be published in a consistent format, as specified in the journal's guidelines.
- i) Journals should have their own website or online system to manage submissions, and the website must be up-to-date and with information identical to that stated in the hard-print version.

In 2011–2012, the TCI launched a quality assessment of journals indexed in the TCI in order to categorize them into three different groups. The peer-review process was used for this purpose, together with the above criteria. Below is the detailed information of how journals are categorized in the TCI database (see more at <http://tci.trf.or.th>):

- 1<sup>st</sup> group: Journals that have quality approval and verification by the TCI (3-year validity) and remain indexed in the TCI database, and will be selected for indexing in the ASEAN Citation Index (ACI), which is also being developed for the first time by the TCI with financial support by the Office of the Higher Education Commission of Thailand.

- 2<sup>nd</sup> group: Journals that have quality approval and verification by the TCI (3-year validity) and remain indexed in the TCI database, and are undergoing quality improvement in order to be transferred to the 1<sup>st</sup> group of journals.
- 3<sup>rd</sup> group: Journals that have not yet qualified for approval by the TCI, and may not be considered for future indexing in the TCI database.

The results of journal quality evaluation will hopefully enhance the improvement of management and quality of Thai academic journals, leading to a higher (i.e. international) standard content and format. Consequently, the Royal Golden Jubilee Ph.D. Program (RGJ-Ph.D.) of the TRF has immediately recognized such an assessment program of journal categorization by the TCI by approving journals classified by the TCI Centre in the 1<sup>st</sup> group as journals in which RGJ-Ph.D. scholars can publish their research findings for completing the funded scholarships and research projects (The Thailand Research Fund 2011).

Moreover, the TCI has recently received evidence and confirmation from many editors proving that the number of submissions for peer review for publication has been increasing. In this respect, editors have more choices to select better articles and more qualified submissions for publication. This means that the rejection rate for submissions has increased. It has also been noticed that published articles have better formats and a greater number of citations. This has most likely resulted from the assessment and classification program of Thai journals by the TCI Centre as mentioned above, which has influenced editors to emphasize the importance of the peer-review process.

### **iii) Awarding Best Thai Journals on the National and International Levels**

In 2011, the Office of the Higher Education Commission (OHEC) of Thailand, the Thailand Research Fund (TRF), the Thai-Journal Citation Index (TCI) Centre, and Scopus (Elsevier) jointly organized and announced the first TCI-SCOPUS-TRF Journal Award for high-quality Thai journals. The TCI-SCOPUS-TRF Journal Awards are classified into two categories, one being an “International TCI-SCOPUS-TRF Journal Award” for high-quality Thai journals indexed in the TCI and SCOPUS databases, and the other being a “National TCI-SCOPUS-TRF Journal Award” for high-quality Thai journals indexed in the TCI database. These awards were considered to be the first time that awards had been given to Thai journals with the expectation of competitive quality development, i.e. that Thai journals would continue to be upgraded and improved to international standards. In 2011, 82 applications were received from Thai editors, three of which were awarded: these being the *Southeast Asian Journal of Tropical Medicine and Public Health*, the *Journal of the Psychiatric Association of Thailand*, and the *Journal of Nursing Science*. The criteria used for evaluations for the awards were very similar to the selection criteria used for the inclusion of journal titles in well-recognized international databases such as Thomson Reuter (ISI) and Scopus. This will be beneficial for the editors of local journals, so that they might incorporate the essential criteria for improving journal quality in order to meet international standards.

As the organizer of this project, TRF and TCI Centre hoped that the awarded journals would take a step forward towards becoming more renowned or fully accepted as international journals in the near future in order to serve the academic community not only within Thailand but also worldwide. The awarded journals will also set a good example for other journals to follow, in anticipation of the next award-giving announcement. Apart from bestowing such awards on outstanding journals, this project has clearly generated synergic support from and collaboration with national (TRF and TCI) and international (Scopus)

parties to drive Thai journals toward an improved standing. In addition to the giving of awards, it is useful to note that all applicants, especially those not receiving awards, were offered useful and constructive comments and suggestions from the award selection committee for future quality improvements regarding issues that had arisen during the evaluation process. This would hopefully enhance the quality of Thai journals across the country.

**iv) Increased National Visibility: More People are Reading Thai Research Articles**

Figure 1 shows TCI Journal Impact Factor (T-JIF) values during the years 2002 to 2010; this indicates that the number of journals with T-JIF values tends to increase every year (the X axis), and that the average and quantitative T-JIF values (Y axis) also increase with time. It may be supposed that the journals indexed in the TCI database are more recognized and increasingly cited; or in other words, more people are able to access and read Thai research articles. This is the result of setting up the database for searching articles published in Thai journals. The T-JIF values of the journals in the TCI database can be accessed from the TCI Centre website (<http://tci.trf.or.th>).

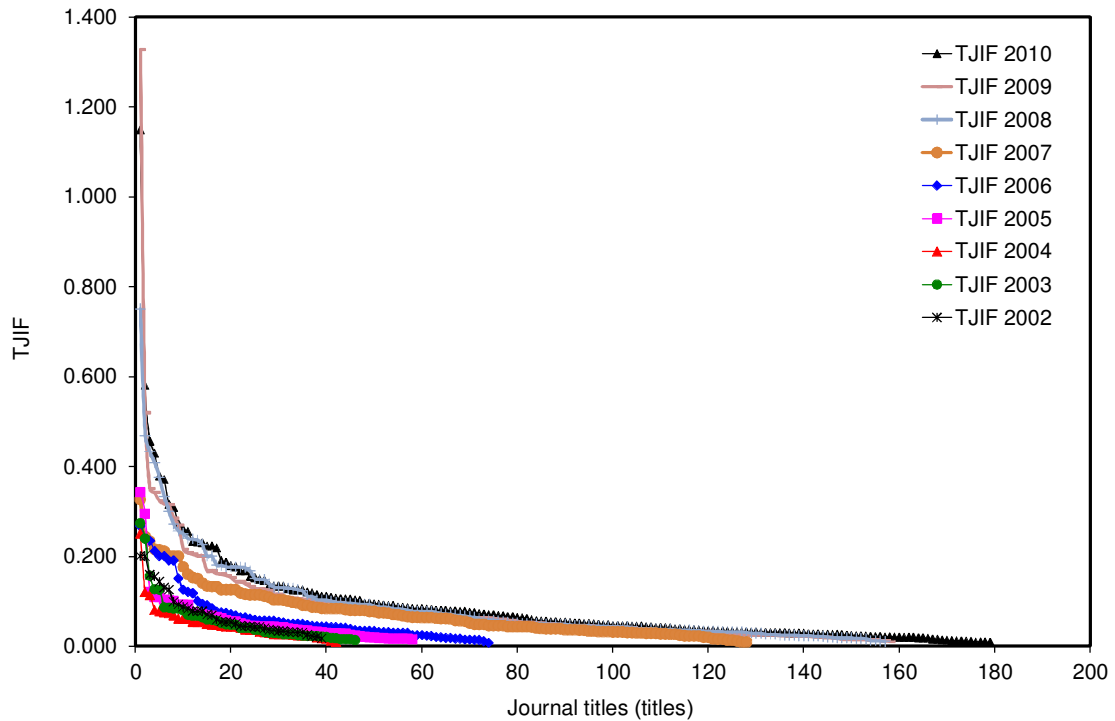


Figure 1: TCI Journal Impact Factor (T-JIF) Values during the Years 2002–2010

**v) Greater International Visibility**

It appears that after the establishment of the TCI in 2001, the articles published in Thai journals have gained greater visibility, and Thai editors are more aware of the international quality of academic journals. There has been a major effort for Thai journals to be included in international databases. Since 2005, there has been a significant increase in the number of Thai journals accepted and indexed by the Thomson Reuters (ISI) and Scopus databases.

Table 1 shows the list of Thai journals indexed by Thomson Reuters and Scopus before and after 2005. Part of this success is from an official collaboration between TCI centre and the Scopus database which mutually agreed that Thai senior and experienced researchers should take part in evaluating Thai academic journals and proposing ones of sufficient quality to be considered and indexed in the Scopus database. The visibilities in the TCI and Scopus databases will eventually lead to being indexed by other international databases, such as Thomson Reuters.

Table 1: List of Thai Journals Indexed by the Thomson Reuters and Scopus before and after the Year 2005

Indexed Before 2005	
<b>Thomson Reuters*</b> (as of June 2012)	1. Asian Pacific Journal of Allergy and Immunology (before 2001-ongoing)
<b>Scopus**</b> (as of October 2011)	1. Journal of the Medical Association of Thailand (1970-ongoing)
	2. Southeast Asian Journal of Tropical Medicine and Public Health (1971-ongoing)
	3. Asian Pacific Journal of Allergy and Immunology (1983-ongoing)
	4. Asia-Pacific population journal / United Nations (1986-ongoing)
	5. International Agricultural Engineering Journal (1994-ongoing)
	6. Asian Pacific journal of cancer prevention : APJCP (2003-ongoing)
Indexed After 2005	
<b>Thomson Reuters*</b> (as of June 2012)	1. Asian Pacific Journal of Allergy and Immunology (before 2001-ongoing)
	2. Asian Biomedicine (2007-ongoing)
	3. Maejo International Journal of Science and Technology (2007-ongoing)
	4. Thai Journal of Veterinary Medicine (2007-ongoing)
	5. Buffalo Bulletin (2008-ongoing)
	6. Chiang Mai Journal of Science (2008-ongoing)
	7. ScienceAsia (2008-ongoing)
	8. Southeast Asian Journal of Tropical Medicine and Public Health (2009-ongoing)
<b>Scopus**</b> (as of October 2011)	1. Journal of the Medical Association of Thailand (1970-ongoing)
	2. Southeast Asian Journal of Tropical Medicine and Public Health (1971-ongoing)
	3. Asian Pacific Journal of Allergy and Immunology (1983-ongoing)
	4. Asia-Pacific population journal / United Nations (1986-ongoing)
	5. International Agricultural Engineering Journal (1994-ongoing)
	6. Asian Pacific journal of cancer prevention : APJCP (2003-ongoing)
	7. Kasetsart Journal - Natural Science (2006-ongoing)
	8. Kasetsart Journal - Social Sciences (2006-ongoing)
	9. ScienceAsia (2006-ongoing)
	10. Songklanakarin Journal of Science and Technology (2006-ongoing)
	11. Asian Biomedicine (2008-ongoing)
	12. Buffalo Bulletin (2008-ongoing)
	13. Chiang Mai Journal of Science (2008-ongoing)
	14. Thai Journal of Veterinary Medicine (2008-ongoing)
15. Chiang Mai University Journal of Natural Sciences (2009-ongoing)	
16. EnvironmentAsia (2009-ongoing)	
17. Journal of Health Research (2009-ongoing)	
18. Maejo International Journal of Science and Technology (2009-ongoing)	
19. Thai Journal of Pharmaceutical Sciences (2009-ongoing)	
20. Thai Journal of Mathematics (2011-ongoing)	

\* from: <http://ip-science.thomsonreuters.com/mjl/>

\*\* from: <http://www.info.sciverse.com/scopus/scopus-in-detail/facts>



**vi) Better Identification of Thai Research Performance**

The National Research Council of Thailand (NRCT) has expressed the intention to promote research quality in Thailand in the years 2012–2016, to help build the academic capability and economy development of the country. The main aims are to conduct and support Thai research related to agricultural products and development. The agreed research fields to be promoted include rice, cassava, rubber, corn, palm oil, sugarcane, vegetables, fruits and flowers, tourism, logistics, and information technology and communications. The main purposes are to enhance the competitiveness of the country at both national and international levels, and to prepare for entry into the ASEAN Economic Community (AEC), with the goal of regional economic integration by the year 2015. Also, in 2009 the Ministry of Education (Thailand), through the Office of the Higher Education Commission (OHEC 2009), issued an emergency initiative to develop national research universities to reach an international standard (The Office of the Higher Education Commission,2012). In order to fully develop the country’s international potential and capabilities, Thailand inevitably must strengthen the current status of research performances and activities in niche (i.e. specialized) areas, especially in rice, cassava or tapioca, rubber, tourism and logistics. This is how the TCI has become involved. The information in the TCI database assists in assessing local research performance in order to identify outstanding researchers and research organizations in a specific field.

Table 2 shows the number of publications and citations of Thai researchers in the TCI and Scopus databases during the years 2001 to 2010, with particular regard to searches of prominent research papers on areas of the national strategic research of Thailand, such as tapioca, rubber, tourism and logistics. This work is currently supported by the Knowledge Network Institute of Thailand (KNIT). It was found that Thai researchers’ articles about rice, tapioca, tourism and logistics were published more often (or greater in volume) in Thai academic journals indexed in the TCI than in international academic journals indexed in Scopus. However, the opposite situation existed in the case of rubber research. This highlights the importance of national citation database, like TCI in this particular case. It can thus be concluded that a database of national academic journals is essential and of great significance because it can be used as important information for developing and enhancing national research to be in harmony with international context and realities. Without TCI the total research performance in rice, tapioca, tourism and logistics of Thai researchers would never be revealed and known.

Table 2: Total Publications and Citations of Thai Researchers in the Fields of Rice, Tapioca, Rubber, Tourism and Logistics Indexed in TCI and Scopus Databases during 2001-2010

Disciplines	Number of publications (items)		Number of citations (times cited)	
	SCOPUS	TCI	SCOPUS	TCI
Rice	168	<u>565</u>	1,156	23
Tapioca	106	<u>133</u>	810	9
Rubber	<u>386</u>	191	2,069	25
Tourism	6	<u>640</u>	25	24
Logistics	62	<u>214</u>	344	18

**vii) Organizing Annual Symposium to Gain Understanding and Local Acceptability**

The TCI Centre usually arranges a meeting every year in order to create networking systems among Thai editors and administrators for emphasizing the quality development of academic and local journals in Thailand, and also to report on current situations of Thai

journals. In these annual meetings, many editors, administrators and other attendees exchange experiences, opinions, ideas or problems, and suggest possible directions for improving the quality of Thai journals – not only in an academic sense, but also in social and community terms. During the past years, six meetings have been held, with a total of 1,200 attendees. At the 4<sup>th</sup> through 6<sup>th</sup> meetings (2009–2011), the TCI Centre invited experts from Scopus (Elsevier) to share with Thai editors their ideas for the direction of journal management, in order to further their upgrading toward international standards (see Figure 2).



Figure 2: Annual Symposium of the TCI Centre

**FROM TCI WITH LOCAL ACCEPTABILITY TO ACI, TOWARDS INTERNATIONAL STANDARDS.**

**Development of the ASEAN Citation Index (ACI) Database**

Before discussing ASEAN Citation Index database, it is worth mentioning the key reasons for paying great attention to national and regional databases. Table 3 shows number of published articles written by ASEAN researchers, except for Thai researchers, which are indexed in the TCI database during 2002-2011. It can be found that all nine ASEAN researchers have their articles published in Thai journals, especially Malaysia that has 717 articles. If there was no national database like the TCI centre, we may have never seen these research outputs and visibilities of the ASEAN countries. Another example for establishment of national and regional databases is that the increasing magnitude of publication volume from the ASEAN researchers appears to be much greater as compared with that from other regions. This statement is substantiated by Table 4 which lists the publication quantity for researchers from worldwide, Asiatic and ASEAN countries during 1996-2010 by SCIMAGO-Scopus database. It is also believed that there are still a number of publications from the ASEAN researchers that have not yet been indexed by any international databases. If this is the case, the establishment of national and ASEAN citation index databases will solve this problem. In summary, it confirms that the research performance evaluations should take the national and regional databases into account in parallel to the international databases.

Table 3: Number of Published Articles Written by ASEAN Researchers, except for Thai Researchers, which are indexed in the TCI database during 2002-2011

No.	Country	No. of articles
1	Malaysia	717
2	Viet Nam	103
3	Indonesia	94
4	Singapore	93
5	Philippines	77
6	Lao PDR	55
7	Cambodia	36
8	Myanmar	28
9	Brunei Darussalam	13

Table 4: Publication Quantities for Researchers from Worldwide, Asiatic and ASEAN Countries during 1996-2010 by SCIMAGO-Scopus Database. (at 11 May 2012)

Years	Worldwide	Asiatic	ASEAN
1996	1,124,261	159,052	6,132
1997	1,150,355	171,533	7,232
1998	1,142,426	178,062	7,372
1999	1,151,601	187,781	8,675
2000	1,221,158	199,746	9,806
2001	1,318,342	217,054	9,769
2002	1,350,850	218,864	10,406
2003	1,413,906	251,756	12,955
2004	1,565,695	296,032	14,059
2005	1,730,364	370,477	17,876
2006	1,811,071	416,089	22,096
2007	1,891,849	447,061	23,663
2008	1,924,519	487,563	28,188
2009	2,159,231	595,908	34,792
2010	2,406,772	666,569	42,941
<b>Total 96-10</b>	<b>23,362,400</b>	<b>4,863,547</b>	<b>255,962</b>
<b>Growth</b>	<b>114%</b>	<b>319%</b>	<b>600%</b>

In 2011, the Office of the Higher Education Commission (OHEC) of Thailand supported the TCI in establishing the ASEAN Citation Index (ACI) database. This is to be in line with the ASEAN Economic Community (AEC). In this regard, the TCI will take action in developing the ACI database by supporting the establishment of National Citation Indexes (NCIs) for ASEAN countries. The NCIs would be one mechanism for upgrading local ASEAN journals to international standards. Once the NCIs exist and are sufficiently mature, they would be linked to the ACI database. The ACI would be the central regional database for indexing all bibliographic information (publications and citations) appearing in ASEAN academic journals. In addition, having ACI as the central database would stimulate and encourage the sharing of knowledge on how to improve journal quality within the ASEAN region. The conceptual framework for developing NCIs in connection with the ACI database is given in Figure 3. Furthermore, once the ACI can become fully developed, in terms of its content, stability and usage, it can easily be linked to international databases such as Scopus and Thomson Reuters, as shown in Figure 4.

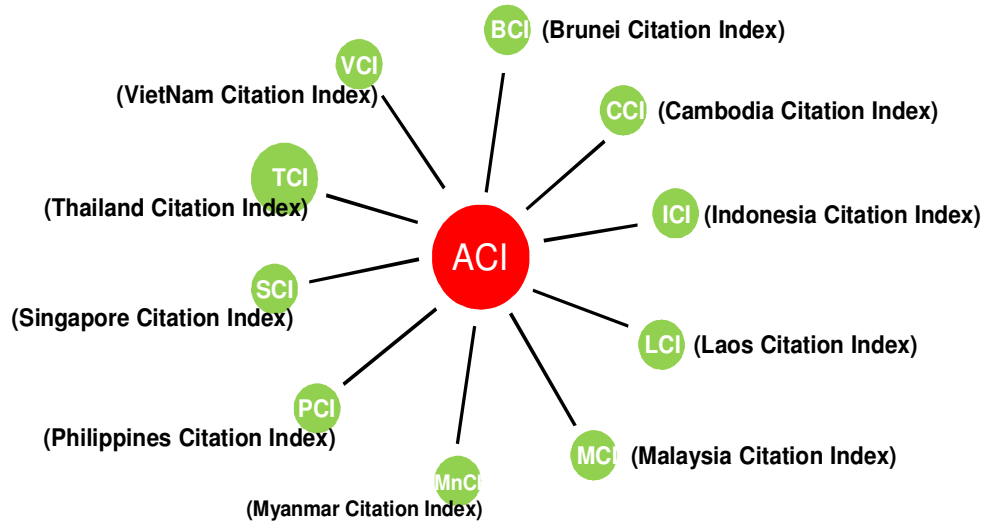


Figure 3: Conceptual Linkage between the National Citation Index (NCI) and the ASEAN Citation Index (ACI) for ASEAN Countries

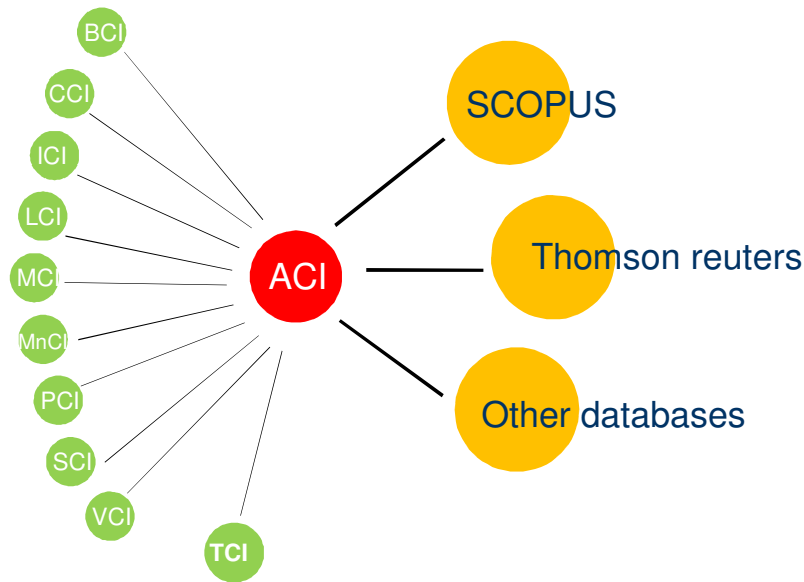


Figure 4: Conceptual Linkage of National, ACI, and Other International Databases

Figure 3 also depicts an ideal scenario in which online journal sites at institutional (repository and full-text databases) and national (full-text database) levels are well-integrated with a national citation index database. The NCI will serve as a national Abstract and Index (A&I) database to provide data such as article usage and article citations in local journals so that the quality of all local journals can be objectively measured. In addition, as an integral part of this integrated framework, each ASEAN country is encouraged to establish its own National Citation Index (NCI), so that bibliographic data from individual

countries can be integrated to form the regional ACI database. The detailed roles of NCIs and the ACI database, and the benefits of establishing such a publishing network, can be found in our previous work (Sombatsompop, 2011). Future issues to be addressed for ACI database development are: (i) each ASEAN country should set up its own “National Citation Database, (NCI)” as quickly as possible, and this should be encouraged by the Secretary-General of all ASEAN countries; and (ii) a steering board should be formed by representatives from ASEAN members in order to set out selection criteria for title inclusion and policies to guide the effective operation of the ACI database. However, in cases where the establishment of NCIs may be time-consuming and difficult, it has been proposed by the TCI that the inclusion of journal titles in the ACI could be accomplished by individually applying to the steering committee for consideration and approval.

### **Establishment of the Expert Content Selection & Advisory Committee of Thailand**

In 2009, the TCI Centre in collaboration with the Scopus database mutually agreed that Thai senior and experienced researchers should take part in evaluating Thai academic journals and proposing ones of sufficient quality to be indexed in the Scopus database. The Thailand Research Fund (TRF) in collaboration with the TCI Centre proposed a list of Thai professors and experts with a good understanding of the context and quality of international standards who would review Thai journals for indexing in the Scopus database. The proposed committee has officially been approved by Scopus, and is now called the Expert Content Selection & Advisory Committee of Thailand (ECSAC of Thailand) (SciVerse 2011). The main duty of the ECSAC committee is to review and make recommendations to the Subject Chairs of Scopus as to whether the submitted journal titles should be indexed in the Scopus database. This activity is the first of its kind in the world, and is believed to be one of the most effective mechanisms for developing the quality of Thai journals toward an international level and to improve the visibility of Thai journals.

Since the establishment of the ECSAC of Thailand, experience has indicated several immediate benefits, which include: (i) more Thai journals will be indexed by the Scopus database (see Table 2); (ii) articles published in Thai journals will be more visible and internationally acceptable, and hopefully will be cited more often by international researchers, indicating greater international recognition; (iii) the peer-review process of Thai journals as a whole is becoming much more rigorous, because journals must ensure the quality of their articles in order to meet the selection criteria of the Scopus database; (iv) the number of Thai journals is likely to be reduced, especially low-quality or departmental and faculty journals, which might decide to terminate themselves due to low submission rates and delayed publication dates; and (v) the quality of research output (publications and citations) by individual researchers and research institutions in Thailand will eventually be improved in order to attain international standards.

### **CHALLENGES BEING FACED AND CURRENT DEVELOPMENT**

Although there have been many advantages and benefits resulting from TCI helping to disseminate research, especially in terms of visibility and impact, there are also a number of challenges and difficulties being faced, which include:

- a) High-quality research articles are still primarily aimed at submission to international journals. Thus, the citations of Thai articles remain low.

- b) The most experienced and skilled professors remain reluctant to publish their research work in Thai journals.
- c) Since most editors of Thai journals are well-known by the submitting authors, the peer-review process is hence expected to be biased and weak (Premkamolnetr, 2006). Besides, most Thai journals are produced at the faculty and/or university level; thus the publishing policies are dependent on its own administrators.
- d) Most editors (mostly vice-presidents or directors of research and development institutes) are still commissioned by duty and not by choice, and are performing editorship work part-time with limited financial support.
- e) Most Thai journals and their articles still have low visibility (number of citations) by their regional and international peers, mainly due to being published in the Thai language (Sombatsompop, 2011) and also because of hard-copy printing. Most of the citations received are from within Thailand.

Apart from routine work – such as keying-in of publications and citations, calculations of Thai-journal impact factors (T-JIF), conducting research and services, and ACI development – the TCI has proactively encouraged all indexed journals to launch a Thai Journal Online (Thai-JO) system. This will be used for manuscript submission and tracking and for the peer-review process, as well as for online publication after acceptance, in order to reduce the managing costs from submission to final publication, and also to reduce the time spent and documents lost in the postal system. So far, less than 20 journals out of the 480 journals in the TCI database have currently used the online journal system for publication.

## **CONCLUDING REMARKS**

During its ongoing development in the past 10 years, the Thai-Journal Citation Index Centre (TCI Centre) has played an increasingly significant role in driving and increasing the visibility and quality of local and national research. However, there are still a number of difficulties and challenges to be faced, especially in terms of the academic acceptability of local research findings and peer-review stringency, particularly by internationally oriented researchers. A number of TCI activities have been designed to promote and disseminate the visibility of national research findings; these include the quality assessment program for Thai journals in TCI, the TCI-SCOPUS-TRF journal award, and the Thai Journal Online (Thai-JO) system. It is hoped that the ASEAN Citation Index (ACI) database is being established in order to be part of the ASEAN Economic Community (AEC), and will be used as a tool in assessing local and regional research reports in parallel with international studies, resulting in more accurate and wider research performance evaluations for researchers, research institutions, and countries. With such information, funding agencies and university leaders can make better funding and promotion decisions. In addition, both ASEAN and non-ASEAN students will have more reliable information for selecting a university best suited to furthering their studies.

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