**Annual Report* of IGCP Project No._589_

*NOTE: MAXIMUM LENGTH OF THE TEXT REPORT IS 5 (FIVE) PAGES. SINGLE SPACE, 12 POINT FONT. REPORTS EXCEEDING THIS LENGTH WILL BE RETURNED TO THE AUTHOR(S) WITH THE REQUEST OF REDUCING THE TEXT TO THE ABOVE STANDARD.

The scientific information in this report will further be used for publication on the IGCP website under the new electronic version of 'Geological Correlation' (please feel free to attach any additional information you may consider relevant to the assessment of your project).

**IGCP project short title:** Development of the Asian Tethyan Realm

**Duration:** 2012–2016

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Project Secretary:

Name:
Address:
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Fax:
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Date of submission of report: 08 December 2012

Signature of project leader(s):
Please use the following headlines to report the present status and scientific achievements of your project (write N/A where not applicable) and explain abbreviations you use in your report.

1. Website address related to the project
   http://igcp589.cags.ac.cn/

2. Summary of major past achievements of the project
   N/A. This is the first year of the project.

3. Achievements of the project this year only
   
   3.1. List of countries involved in the project (please *indicate the countries active this year)

   3.2. General scientific achievements and social benefits
   (Meetings are not considered as scientific achievements, they should be listed under heading 3.3.)

   We constructed the project website, which provides a convenient platform for information briefing and data share, as well as diffusing geological knowledge to the public.

   Multi-disciplinary studies in key areas of the Asian Tethyan Realm by participants from different countries have made progress and yielded new data. Some of them are:

   **Zagros and Iranian plateau**
   ♦Study on the oldest (Neoproterozoic–Early Cambrian) metamorphic rocks exposed in the Saghand region has reached the following understandings: 1) the protoliths of the gneisses in the Saghand region were deposited at an active continental margin setting; 2) a continental margin magmatic arc (Andean-type) formed the Saghand Precambrian basement; 3) strips of ultramafic rock in the Saghand region can be attributed to lithospheric remnants of the Proto-Tethyan Ocean.

   **Qinghai-Tibet Plateau, Cimmerian**
   ♦Paleomagnetic investigations of lower Permian basalt suites allow deducing that the Baoshan block was against Gondwana within a narrow longitudinal belt close to where northern India and northwestern Australia were once in close proximity. Furthermore, the Sibumasu lay to directly the east, offshore of Australia.

   ♦Regional geological studies reveal that continental rifting took place in the Triassic along the Yarlung Zangbo, Bangong-Nujiang zones and the zones in interior Gondwanan continent, where the Indian Ocean originated. The difference is that the Indian Ocean developed successfully into a large ocean. The Bangong-Nujiang and Yarlung Zangbo rifting zones failed to develop into large oceans, though oceanic crust occurred. They closed in late Jurassic and Cretaceous respectively.

   ♦Stratigraphic, sedimentologic studies and basin analysis of the Cretaceous–Paleogene succession in southern Tibet show that the India-Asia initial collision should have happened before the late Danian (~62 Ma) when the Zongpu Formation deposited.

   ♦Geochemical studies on Late Permian (~270 Ma), Early Jurassic (~190-200 Ma), Early Cretaceous (~135 Ma), and Late Cretaceous (~70 Ma) mafic magmatic rocks in the Tethyan Himalayan area provide new constraints on the development of Neo-Tethys.

   **The Qinling - Dabie orogens**
   ♦Sedimentologic study of the successions in sedimentary basins at the flanks of the Dabie orogenic belt shed new light on the development manner of the Dabie orogenic belt, which underwent deep subduction of continent, rapid exhumation, and huge
amount of erosion during the Mesozoic.

- Geochronological and regional geological data let conclude that the Palaeozoic tectonic evolutionary processes of the Qiling orogen are characterized by a long-lived (ca. 534 to 420 Ma) Shangdan Ocean, and the Erlangping back-arc basin experienced a short evolutionary history and closed before 460 Ma.

**Mainland Southeast Asia**
- Geyophysical and petro-chemical results show that the Nan suture was formed in an island-arc environment of compression tectonic setting and not by continental collision as previously thought.
- New paleontological data, petrographic and geochemical data of clastic rocks, and U-Pb ages of detrital zircon from mélangé within the Inthanon Zone, Northern Thailand provide more constraints on the history of the Inthanon Zone and finally lead to a better understanding of Paleotethys in Thailand.
- New paleontological results provide age and paleobiogeographic constraints on the development of Tethys in mainland Southeast Asia.

**Japanese islands**
- Paleontological and paleomagnetic results allow deducing that the Kurosegawa Terrane in the accretionary complex in Southwest Japan was the easternmost element of the South China Block at least from the Late Triassic to the Early Cretaceous. The terrane was then translated northward from the continental margin to its present position, associated with large-scale sinistral strike-slip movement along the East Asian continental margin in mid- to Late Cretaceous times.
- Study of bedded manganese ore deposits in Shikoku, SW Japan shows that they might have been 1) manganese nodule/crust-bearing siliceous sediments on deep-sea floor; 2) the hydrothermal precipitates associated with submarine volcanism.

**Philippine islands**
- Paleontological (radiolarian) study of the sedimentary rock associated with the Zambales Ophiolite Complex shows that the two blocks of the complex were formed at different time – the Acoje block was formed in Middle Jurassic-Early Cretaceous, whereas the Coto block was formed during the Eocene. Their different geochemical signatures also suggest a progressive tectonic shift from an island arc to a back-arc environment. These results call for a re-evaluation of the previous tectonic models on the Zambales Ophiolite genesis.

### 3.3. List of meetings with approximate attendance and number of countries

The First International Symposium of IGCP-589 was held on 27-28 October 2012 in Xi'an, China. Post-Symposium Excursion was conducted from 29 October to 1 November 2012 in the Qinling Orogen, China. 33 abstracts/papers were received from 9 countries. More than 40 persons attend the meeting, 17 oral presentations and 11 poster presentations were given.

Symposium 34.1 of 34th IGC with the theme “Geological Processes of the construction of Asia” is a result of the cooperation between the CGMW projects “International Geological Map of Asia (1: 5,000,000) (IGMA5000) and the IGCP-589. The conveners REN Jishun, M. Pubellier and JIN Xiaochi are active participants of both projects. 32 abstracts were received from 11countries. 14 oral presentations were given on 8 August, and the rest are mostly in the form of poster presentations.

### 3.4. Educational, training or capacity building activities

We encouraged more students to participate in the project by actively taking part in field work, laboratory investigation and international meetings. During the first symposium of the
project graduate students of the Xi’an Institute of Geology and Mineral Resources were very active. We also spared no pains to publicize geological knowledge to local people during the symposium and field excursion. Our website also provides a convenient platform for data share and for diffusing geological knowledge to the public.

3.5. Participation of scientists from developing countries, and in particular young and women scientists

Most participants of our project are from developing countries. About a quarter of them and women scientists and one third are young scientists. PhD students are important components of participants.

3.6. List of most important publications (including maps)

The proceedings of the symposium was published as a supplement issue of volume 33 of Acta Geoscientica Sinica, in which 33 abstract/papers are contained. The contents of that issue is attached to Meeting Report (Form IV)


3.7. Activities involving other IGCP projects, UNESCO, IUGS or others

Our project closely collaborated with the Commission for Geological Map of the World (CGMW) project "International Geological Map of Asia (IGMA5000). The Symposium 34.1 of 34th IGC with the theme “Geological Processes of the construction of Asia” is a result of the cooperation between the two projects. The CGMW is affiliated to IUGS and is eligible for UNESCO funding, part of which is devoted to the co-publication of maps.

4. Activities planned

4.1. General goals

To strengthen the investigation on the Asian Tethyan Realm by means of carrying out multi-disciplinary studies in key areas; To timely exchange scientific achievements and ideas.

4.2. Tentative list of specific meetings and field trips (please list the participating countries)

The second international symposium of IGCP-589 is going to be held in the Philippines. Also planned are pre- and post-symposium excursions examining the geology of the Philippine islands. Scientists from Australia, China, France, India, Indonesia, Iran, Italy, Japan, Malaysia, Mongolia, Philippines, Poland, Republic of Korea, Russia, Thailand, UK, and Vietnam are expected to participate in the symposium and excursions.

5. Project funding requested

We request USD 8000 for the year 2013. We plan to support 12 scientists from developing countries to participate in the second international symposium of our project, each with USD 600, and USD800 for the symposium organisers in Philippines.

6. Request for extension, on-extended-term-status, or intention to propose successor project

N/A

7. Financial statement ($ USD only)

The IGCP Scientific Board would like to be informed how the IGCP funds were used and if additional funding was obtained from different sources.
Our project was funded with USD 5000 for the year 2012. We supported 9 scientists (including 2 PhD students) to participate in the first international symposium of the project and post-symposium excursion, each with USD 500, except one with USD 600. USD 400 was for drivers of rented cars and bus.

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<th>Name</th>
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<tr>
<td>Minjin Chuluun</td>
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<td>Punya Charusiri</td>
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<td>Diane Chung (student)</td>
<td>China (HK)</td>
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<tr>
<td>Wickanet Songtham</td>
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<td>Akira Miyahigashi (student)</td>
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<td>Michal Krobicki</td>
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<td>Karlo L. Queano</td>
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<td>Local transport (for drivers of rented cars and bus)</td>
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<td>Total</td>
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The cost of publication of the proceedings (ca. USD 3,500) and other administration costs were covered by project leader’s related research projects.

8. **Attach any information you may consider relevant**