

Annual Work Report of HIST

(2018)

This annual report has been prepared with a view to inform members of the Governing Board activities implemented by HIST in 2018. It is based on the Biennial Work Plan for 2018 and 2019 which was approved by the Board on November 5, 2018.

HIST successfully completed its first six years (2011-2016) of operation in 2017. An evaluation was undertaken by UNESCO in December 2016. As a result, the UNESCO Executive Board, at its 202nd session held in Paris, France, in October 2017, decided to renew the status of HIST as a category 2 centre under the auspices of UNESCO for another six year from 2018 to 2023. The renewal agreement of HIST was signed on 4 November, 2018.

After the signing ceremony of HIST renewal agreement, the 1st session of HIST Governing Board for the 2nd phase (2018-2023) was held on the 5th of November 2018. The Mid-term Strategic Plan (2018-2023) and Biennial Work Plan (2018-2019) of HIST were reviewed and approved at the meeting.

According to the Biennial Work Plan which includes 6 actions that were going to be implemented during 2018-2019, the annual work report concludes HIST's work of 2018 under the framework of these 6 actions.

Action 1: Consultation with UNESCO for signing the agreement between UNESCO and the Government of China on HIST's 2nd phase operation and other relevant issues.

The expected outcome of this action and the timeline foreseen, respectively, are:

Signing of the Agreement between UNESCO and the Government of China represented by the Chinese Academy of Sciences before the end of 2018.

Implementation of Action 1:

After a series of interactive communication among UNESCO, Chinese Government, and HIST, the renewal agreement of HIST was finalized in the middle of 2018. The objectives, functions and the composition, and responsibility of the Governing Board of HIST were defined in the agreement. Meanwhile, the agreement also defined the specific contributions by both parties (the Government of China and UNESCO).

On the 4th of November 2018, President of the Chinese Academy of Sciences, Prof. Bai Chunli representing the Government of China and Assistant Director-General for Natural Sciences, Dr. Flavia Schlegel representing UNESCO, signed the renewal agreement of HIST, marking the beginning of the second phase of HIST's operation.

Action 2: Consultation with UNESCO on Composition of the New Governing Board of HIST for the Year of 2018-2020.

The expected outcome of this action and timeline foreseen are:

- (1) Composition of the New Governing Board completed by the end of October 2018;
- (2) Two sessions of the Governing Board convened in 2018 and 2019, respectively.

Implementation of Action 2:

(1) Reconstitution of HIST Governing Board. The Chair of HIST Governing Board, Prof. Ding Zhongli called for nominations of new members from UNESCO Secretariat and its advisory bodies, as well as National Commissions of Member States for UNESCO. A nomination committee for the Governing Board was formed to review all the received nominations. HIST Governing Board was reconstituted based on the review and selection. HIST Governing Board for the period 2018-2021 has been formed as follows:

Chairman:

Prof. Ding Zhongli, Vice President, Chinese Academy of Sciences(CAS)

Members (in alphabetical order):

Dr. Miguel Clusener-Godt, Director of Division of Ecological and Earth Sciences& Secretary for MAB Program, Sector of Natural Sciences, UNESCO

Dr. Douglas Comer, Chairman, US Committee for the International Council on Monuments and Sites (US/ICOMOS)

Dr. Guy Debonnet, Chief, Natural Heritage Section, World Heritage Centre, UNESCO

Prof. HuadongGuo , Director of HIST; Academician of the Chinese Academy of Sciences; Academician of the World Academy of Sciences; Academician of Russian Academy of Sciences

Dr. Rosa. Lasaponara, Senior Research Fellow, National Research Council of Italy

Prof. Ana Roders, Professor in Heritage and Values, Delft University of Technology, the Netherlands

Dr. JunShao, Division Director, Dept. of World Cultural Heritage, State Administration of Cultural Heritage

Dr. ZhihuaZhou, Deputy Director-General, Dept. of Natural Reserves Management, State Forestry and Grassland Administration

(2) 1st Session of the new Governing Board. The first session of HIST Governing Board (“GB”) for the 2nd phase (2018-2023) was convened on the 5th of November 2018. The Board reviewed the

Rules of Procedures of GB, adopted the Mid-term Strategic Plan and Biennial Work Plan of HIST. The Board also listened to the oral presentation on the Annual Report of 2018 and requested that a written report be sent to all the GB members for comments and adoption by the end of 2018. The Board also had thorough discussions on the possible contributions that the GB members may make to the development of HIST.

Action 3: Collaborating with UNESCO Member States on UNESCO Designated Areas.

The expected outcome of this action and the timeline foreseen are:

- (1) At least two developing countries from the Asia Pacific Region and Africa identified as partners for developing research and capacity building projects as indicated in MTSP objectives 1 and 3 (end of 2019);
- (2) Negotiations and administrative arrangements for cooperative project development and implementation concluded in one country (end of 2018) and in the second country (end of 2019).

Implementation of Action 3:

In addition to the continuous cooperation research work with Cambodia, Sri Lanka and Italy, HIST has initiated a research project "Conservation and Development of Cultural and Natural Heritage along the Belt and Road" under the Strategic Priority Research Program of the Chinese Academy of Sciences: "Digital Belt and Road". The goal of this project is to apply space technologies to World Heritage sites in countries along the One Belt and One Road. Under the framework of this project, HIST conducted the following activities in Tunisia, Pakistan and Myanmar in 2018:

(1) Collaboration with Tunisia. In April, 2018, HIST Team composed of HIST staff and its partners from Italy and Pakistan conducted a joint archaeological project with Tunisian National Heritage Institute and Tunisian Arid Regions Institute in Tunisia, which is located at the western end of the ancient Maritime Silk Road. After a series of longtime indoor processing, interpretation, and analysis of remote sensing images, a field investigation collaborated with local archaeologists was carried out in April 2018. Ten new archaeological sites of ancient Rome in southern Tunisia were identified. A press conference was jointly organized by HIST and its Tunisian partners in the Tunisian Ministry of Culture and unveiled the archaeological discoveries. Prof. Guo Huadong, Director of HIST and Mr. Mohamed Zin Alabidin, Tunisian Minister of Culture, attended the Press Conference. (For detail, please see the website: <http://www.unesco-hist.org/index.php?r=en/article/info&id=1398>).

(2) Collaboration with Pakistan. In November 2018, HIST implemented a China-Pakistan joint field investigation with COMSATS University Islamabad (CUI) in the northern archaeological zone of Pakistan, enhanced the bilateral cooperation of space technologies on archaeology and protection of cultural heritage sites through China-Pakistan Economic Corridor (CPEC). Three world heritage sites and eleven important ancient sites were investigated. An in-depth exchange on the development status and existing problems on archaeological discoveries, heritage conservation, and cultural promotion in Pakistan was held between Chinese and Pakistani experts. (For detail, please see the website: <http://www.unesco-hist.org/index.php?r=en/article/info&id=1422>).

(3) Collaboration with Myanmar. In December 2018, upon the invitation of the Department of Archaeology and National Museum, a HIST delegation visited the ancient town of Bagan in Myanmar which has been nominated for the possible inscription onto the list of World Heritage sites. The delegation made a field survey in the areas of Old and New Bagan and collected necessary information and data which will be used for a collaboration project in 2019. Based on the field investigation, the both parties had a good discussion on the draft of a possible MOU and reached consensus on the tasks of the project and responsibilities of each party. The project is to be carried out in 2019.

In addition to the international cooperation projects, HIST also conducted several domestic projects on space archaeology, and detection and evaluation of anomalous motion of cultural heritage sites. Concluded from the domestic projects, HIST developed a key technology system on space archaeology, and a new application method for radar remote sensing on cultural heritage sites.

To share the methodologies concluded from all demonstration cases of space technology application to World Heritage sites, HIST is developing an information service system for monitoring and evaluating World Heritage sites. This system is designed to make unique contributions to information sharing and sustainable development among the countries along the One Belt and One Road.

Action 4: Enhance Capacity Building for Space Technology Research and Applications for Developing Member States of UNESCO.

The expected outcome of this action and the timeline foreseen are:

- (1) 20-40 participants from Asian and African member states of UNESCO participate in short-term training workshops to be organized by HIST (end of 2019);
- (2) At least 3 scholars from partner countries and organizations seconded HIST to collaborate on developing and implementing studies and research projects on space technology applications addressing conservation, management, monitoring and sustainable development of UNESCO designated areas (end of 2019); and
- (3) At least 2 students from least developed countries start their doctorate studies under the supervision of HIST/RADI scientists on specific research questions pertaining to conservation, monitoring, management and sustainable development of UNESCO designated places with the aid of space technologies (end of 2019).

Implementation of Action 4:

(1) Visiting Scholar: Under the support of the CAS President's International Fellowship Initiative(PIFI), HIST recruited Dr. Lamia Touil from Institute des Regions Arides, Tunisia as a visiting scholar in March 2018. She worked with Prof. Wang Xinyuan for the collaborative research on space archaeology in Ancient Roman Irrigation System in Tunisia.

(2) Ph. D Candidates: Mr. Nabil Bachagha (Tunisian) and Mr. Yves Hategekimana (Rwandan) are

going to get their PHD degree at HIST/RADI majoring in Space Archaeology. Mr. Bachagha did a lot of research work in discovering archaeological sites in Tunisia using space technology, while Mr. Hategekimana focused on archeological discoveries in China.

(3) In November, 2018, HIST co-organized a short training course jointly with Global Geopark Network Office in Longyan National Geopark, Fujian, China for the policy-makers and managers of UNESCO Global Geoparks in China. The course, which was focused on using space technologies for monitoring and better management of the Global Geoparks, include basic knowledge of space technologies, geological analysis of some typical geoparks, virtual reality technologies and application of virtual satellite receiving station, etc. Over 40 participants from 20 UNESCO Global Geoparks in China attended the course and benefited a lot from the presentations and field study.

Action 5: Organizing International Activities for heightening the reputation and visibility of HIST.

The expected outcome of this action and the timeline foreseen are:

- (1) At least one expert meeting to promote applications of earth observation technologies for the benefit of UNESCO designated areas convened and the results and outcome of the meeting published and widely disseminated (end of 2018);
- (2) Communications and dialogue for promoting collaboration with UNESCO and its international advisory bodies, partners, and other UN bodies strengthened or initiated, and joint events and activities organized (end of 2019); and
- (3) At least one international/regional event organized in partnership with the Working Group on Natural and Cultural Heritage of RADI's Digital Belt and Road (DBAR) Scientific Program to promote space technology applications for natural and cultural heritage among countries along One Belt and One Road.

Implementation of Action 5:

Huangshan Dialogue. From 31 October - 03 November, the 3rd Huangshan Dialogue on UNESCO Sites and Sustainable Development, which was jointly organized by HIST/RADI in collaboration with UNESCO World Heritage Centre, Secretariats of MAB Program and of IGGN Program and UNESCO Beijing Office, and hosted by Huangshan Administrative Committee, was held in Huangshan City, Anhui Province, China. Themed "UNESCO Sites Facilitating Sustainable Development", the three-day dialogue hosted series of events focusing on 5 topics: 1) Monitoring Methodologies and Technologies Beneficial for the Sustainability of UNESCO Sites; 2) Disaster Risk Assessment and Mitigation for UNESCO Sites; 3) Multi-stakeholder Engagement for the Sustainable Development of UNESCO Sites; 4) Sustainable Tourism of UNESCO Sites; 5) Cooperation and Common Development among UNESCO Sites along the One Belt and One Road.

About 200 domestic and international policy makers, managers and experts of UNESCO designated sites from international organizations such as UNESCO, ICOMOS and IUCN, and member states of UNESCO from Asia, Europe, Africa and North America attended the Dialogue. Based on the

"Huangshan Declaration" and "Huangshan Recommendation" adopted at the 1st and 2nd Huangshan Dialogue, "Huangshan Consensus" and a "Letter of Intention" calling for cooperation on space technologies for sustainable development among UNESCO sites along the One Belt and One Road were adopted and signed at the 3rd Huangshan Dialogue.

As usual, a publication synthesizing the outcomes and presentations of the 3rd Huangshan Dialogue will be drafted by HIST Secretariat.

The 3 sessions of Huangshan Dialogue efficiently promoted the reputation of HIST as an international centre dedicated to applying space technologies to UNESCO sites. The "Letter of Intention" signed at the 3rd Dialogue marked a new era of cooperation between HIST and countries along the One Belt and One Road on the use of space technologies for conservation, management, and sustainable development of UNESCO sites.

Action 6: Dissemination of research results as well as other data, information and knowledge products for scientists and the general public.

The expected outcome of this action and the timelines foreseen are:

- (1) At least 3 multi-authored publications in internationally recognized journals on the work of HIST/RADI and their contributions to promoting international cooperation on space technologies for natural and cultural heritage (end of 2018);
- (2) Publication and wide dissemination of HIST annual reports for 2018(end of 2018) and 2019 (end of 2019);
- (3) Design and development of plans for the publication of a collection of satellite and air-borne images of World Heritage sites and biosphere reserves in one or a group of countries outside of China including image collection feasibility, image interpretation analyses and explanations on how such analyses could contribute to the management and sustainable development of the sites (end of 2019).

Implementation of Action 6:

HIST brochures and Newsletters (both in English and Chinese) were updated and widely disseminated in a number of international, regional, and domestic events to promote the work of HIST and its interests in collaborating with a range of partners on the application of space technologies for UNESCO sites. Some of the important events are listed below:

- 42nd Session of the World Heritage Committee
- 30th Session of the MAB International Co-ordinating Council
- 8th International Conference on UNESCO Global Geoparks
- 3rd Huangshan Dialogue on UNESCO Sites and Sustainable Development
- 3rd Digital Belt and Road Conference

In order to develop and disseminate methodologies and demonstration cases on using space

technologies to conservation and management of UNESCO sites, the research team of HIST published lots of papers in internationally renowned journals. The most influential 12 papers are listed below:

- 1) Luo L, Wang X., Guo H., Lasaponara R., Shi P., Bachagha N, Li L, Yao Y., Masini N., Chen F., Ji W., Cao H., Li C., Hu N. Google Earth as a powerful tool for archaeological and cultural heritage applications: A review. *Remote Sensing*, 2018, 10, 1558.
- 2) Luo, L., Wang, X., Lasaponara, R., Xiang, B., Zhen, J., Zhu, L., Yang, R., Liu, D., Liu, C. Auto-extraction of linear archaeological traces of tuntian irrigation canals in Miran Site (China) from Gaofen-1 satellite imagery. *Remote Sensing*, 2018, 10, 718.
- 3) Zhu X., Chen F., Guo H. Reconstruction of the water–cultivation paleoenvironment dating back to the Han-Tang Dynasty around the Yangguan Frontier Pass using spaceborne SAR data. *Remote Sensing*, 2018, 10, 1536.
- 4) Tang P., Chen F., Jiang A., Zhou W., Wang H., Leucci G., Giorgi L., Sileo M., Luo R., Lasaponara R., Masini N. Multi-frequency EMI survey for archaeological prospection: approach and results in Han Hangu Pass and Xishan Yang in China. *Surveys in Geophysics*, 2018, 6, 1-18.
- 5) You, Y., Wang, S., Ma, Y., Chen, G., Wang, B., Shen, M., Liu, W. Building detection from VHR remote sensing imagery based on the morphological building index. *Remote Sensing*, 2018, 10, 1287.
- 6) Tang, Y., Zhang, J., Jing, L., Gao, H. Geostatistical modelling of spatial dependence in area-class occurrences for improved object-based classifications of remote-sensing images. *ISPRS Journal of Photogrammetry and Remote Sensing*, 2018, 141: 219-236.
- 7) Integration of multi-parametric fuzzy analytic hierarchy process and GIS along the UNESCO World Heritage: a flood hazard index, Mombasa County, Kenya
- 8) Improved detection of archaeological features using multi-source data in geographically diverse capital city sites
- 9) Jiang A., Chen F.L.*, Liu G. and Tang P. Use of instantaneous GPR attribute integration in prospecting for ancient roads at the Han Hangu Pass, Xin'an, China. *Remote Sensing Letters*, 2018, 9(5):429-437.
- 10) Zhu X., Chen F. L.*, Guo H. Reconstruction of the Water–cultivation Paleoenvironment dating back to the Han-Tang Dynasty Around the Yangguan Frontier Pass Using Spaceborne SAR Data. *Remote Sensing*, 10(10), 1536, 2018.
- 11) Zhang Yunqi, Gong Yingkui, Wangcheng, Xi Xiaohuan, Yang Ruixia. Boundary Delimitation of Wolong Natural Reserve Using AHP and GIS Techniques [J]. *Remote Sensing Technology and Application*
- 12) Shuwen Peng, Xiaohuan Xi, Cheng Wang. Land Use Change Monitoring in Angkor Site Based on Tiangong-2 Wide Band Imaging Data[J]. *Proceedings of the Tiangong-2 Remote Sensing Application, Technology, method and application*, 2018

Staff and cost – a status report as of 14 December 2018

The overall cost for the staff and the above action plan is composed of the following parts:

- (1) Staff Salary:** **¥ 3.75 million RMB (appr. \$547,445 USD)**
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| Research & Engineering Staff(12 persons) | ¥ 3 million RMB (appr. \$437,956 USD) |
| Supporting Staff of the Secretariat (3 persons) | ¥ 0.75 million RMB (appr. \$109,489 USD) |
- (2) Office Cost:** **¥ 125,000 RMB (appr. \$18,248 USD)**

(3) Routine Operation and Administration (Action 1-2 included) :

¥ 400,000 RMB (appr. \$58,394 USD)

(4) Action 3 - Collaborating with UNESCO Member states on UNESCO Designated Areas:

¥ 600,000 RMB (appr. \$87,591 USD)

(5) Action 4 - Capacity Building for UNESCO Less-Developed Member States:

¥ 225,000 RMB (appr.\$32,846.5 USD)

(6) Action 5- Organizing Activities for Promoting Visibility of HIST

¥ 400,000 RMB (appr. \$58,394 USD)

(7) Action 6— Publications

¥ 50,000 RMB (appr. \$7,299 USD)

Total:

¥ 5.55 million RMB (appr. \$0.81 million USD)

(Exchange Rate between US Dollar and Chinese RMB: \$1 : ¥ 6.85)