

# Engineers Without Borders (Hong Kong)

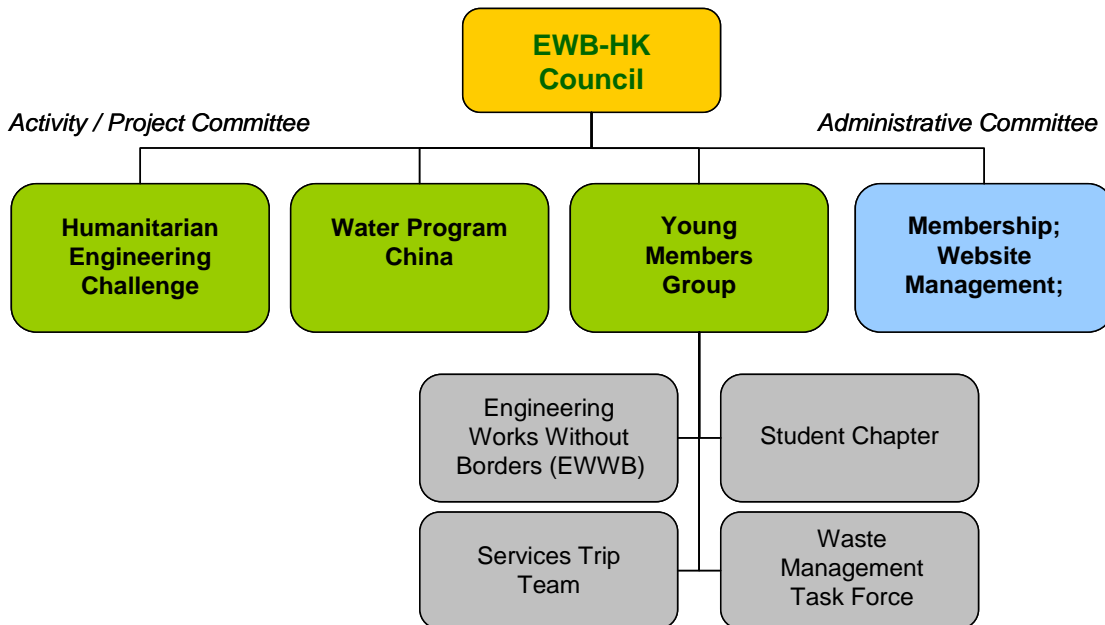
## Annual Report 2014-2015

### Foreword

1. Ever since July 2012 when EWB-HK reshaped its missions, EWB-HK invariably set out their work in line with the new missions, which are repeated here:
  - a) To accelerate betterment in life of disadvantaged communities and promote sustainable development through the empowerment of engineering means.
  - b) To enhance the capacity of Hong Kong's professionals and the generations to come contributing to the communities in need.

### Organization Chart

2.



## Humanitarian Engineering Challenge

3. The Humanitarian Engineering Challenge team was set up to tackle humanitarian problems through engineering means and appropriate technology. 2014 & 2015 is the foundation period in which EWB-HK aim at developing a framework for future by gathering the tools and methodologies for humanitarian work. At the same time, they also have an application focus: Designing clean cook stoves to alleviate household air pollution (HAP) resulting from inefficient solid fuel cook stoves, which is now affecting about 2.6 billion people, leading to over 4 million premature deaths a year.
4. **Goals:**
  - a) Introduce the public to the worldwide household air pollution issue.
  - b) Familiarize with and develop tutorial materials for free 3D CAD design tools and 3D printing.
  - c) Promote DIY approach to achieve massive deployment in humanitarian works.
  - d) Develop Open Source Cookstoves Library (OSoCool) to share HEC designs and to build a culture of collaborative design improvement.
  - e) Run workshops in universities and secondary schools to check the feasibility and fine tune design information to prepare for future deployment.
5. **Progress:**
  - a) Participated in Mini Maker Fair in the Polytechnic University (Oct 2014) and InnoCarnival(Nov 2014)
  - b) Developed tutorial materials for DIY construction and Open SCAD 3D design.
  - c) Conducted Open SCAD design and solar cooker DIY construction workshops in HKUST (Nov 2014) and HKU (Feb 2015) as well as awareness lectures in three secondary schools.
  - d) Developed a concentrating solar cooker reference design with a light weight reflector assembly suitable for DIY construction.
  - e) Developed tools to facilitate construction of the solar cooker.
  - f) Built a prototype in Wing Lung Farm at Hang Hau for further refinement.
  - g) Planning to host a Hackathon in InnoCarnival 2015 to improve on our current open source solar cooker design.
6. **The way forward:**
  - a) Identify deployment opportunities to apply the DIY and clean cook stove designs.
  - b) Support design projects of other EWB-HK teams as needed.
  - c) Explore local opportunities to apply engineering in humanitarian work.

## Water Program China

7. Last year, EWB-HK set the goal for Water Program China as: to collect, transport, store and purify water for places in need in China.
8. By the end of 2014, EWB-HK came to know a charitable organization Go Beyond, and collaborated with it on installing, trialing and improving a ram pump system made with local materials. This is a system that runs on hydraulic power without consuming electricity. In places with dry seasons, the ram pump system can collect water during wet seasons for use in dry seasons. Go Beyond has identified a village in Shilata, Wuding County of Yunnan Province in China as a place to install the system. The place requires conveying water to a height of 50 meters, and the length of piping around 300 to 400 meters
9. In fact this pump was invented for about 200 years. There are manufactured ones being sold in many places. The cost of one such pump made in Europe or America is about HK\$20,000. But a ram pump built of local materials costs only one tenth of that price. To prove a pump made with local materials that can really reach 50 meters, EWB-HK trialed the pump in the following places:
  - a) Wing Lam Garden in Hok Tau
  - b) Wing Lung Farm in Hang Hau, Sai Kung
10. Basic operation and improvement are trialed out in the aforesaid places. But restricted by the terrain, the trialed height is only 18 meters, and the length of piping is 120 meters. Hence a more suitable site at Kadoorie Farm of Taipo is identified to continue with the trial.
11. Regarding water purification, EWB-HK have found some water experts who form a team to provide expert advice to places in need and training courses to volunteers. As for actual work, the search for collaboration with on-site organizations is still going on. Hence there is not much progress made.
12. **The way forward:**
  - a) EWB-HK will continue with the trialing of ram pump system in Hong Kong with a view to improving it.
  - b) In the summer of 2016, EWB-HK, together with Go Beyond, will install the ram pump system in a village at Shilata, Wuding County of Yunnan Province.
  - c) If a suitable place is referred to by an on-site organization, EWB-HK will continue

with installing the ram pump system.

- d) EWB-HK will also strengthen the work on water purification, look for suitable partners for provision of places with drinking water problems.
- e) To organize training courses with a view to providing more volunteers with all- round knowledge of water.
- f) To solicit donations for specific water projects.

## **Young Members Group (YMG) Committee**

13. The second mission of EWB-HK is, “To enhance the capacity of the professionals in Hong Kong and the generations to come to contribute to the communities in need.” Hence emphasis was placed on the development of organization and structure of students in tertiary education and young persons, so that they can participate in the relevant services and organization development early in their lives, gather experience and trained as successors of EWB-HK.

14. EWB-HK’s YMG Committee is an executive committee under the direction of EWB-HK Council. EWB-HK believes that the collaboration with their YMG Committee and Student Chapters is crucial to the successful achievement of EWB-HK’s missions. The slogan of YMG is “Enlightened with Engineering, Serve the Community”.

15. There are 4 teams currently led and supported by the YMG Committee, which are :  
(i) Service Trip team; (ii) Engineering Works Without Borders team; (iii) Waste Management Task Force; and (iv) Student Chapter. In September 2015, YMG started to change the regular meeting to a bi-monthly basis, whilst the meeting is split into 2 sessions: business discussion and sharing by guest speakers. In the coming year, YMG will include the topics of leadership, communication, organization sustainability, humanitarian engineering, sustainable development goals, etc. in their sharing sessions of bi-monthly meetings.

### ***(i) Service Trip Team***

16. The objective of Service Trip Team is to transform the disadvantaged villages into self-sustainable communities, through comprehensive community improvement programs in collaboration with relevant organizations in Hong Kong & Cambodia so as to deliver local services more effectively.

17. **Progress:**

After the 2014 service trip in China GanSu province, the team moved a big step forward

by organizing EWB's 1<sup>st</sup> overseas service trip. Pursuant to the 4-day pre-trip in April 2015 to Cambodia, the team developed a 3-years plan for serving rural areas in Cambodia through engineering technical support and knowledge transfer.

18. The Cambodia service trip was successfully completed on 21~30 June 2015 (10 days) with 20 participants and 1 technical instructor. The trip was in collaboration with Voltra HK and a Cambodia-based social enterprise CYA, so as to enhance the effectiveness of communication with the local communities. A series of design workshops, team building and safety trainings, skill training workshops and technical evaluation meetings were arranged to facilitate the preparation of services trips, with the support offered by Arup, Crossroads International, Hong Kong Playground Association as well as Hong Kong University of Science and Technology SEA Fund and GCE of School of Engineering.

19. **The way forward:**

The team is now preparing for the 2nd Cambodia service trip. The tentative date of the trip will be early 2016, so as to follow up the local needs being identified in the previous trips and the continuous communications with the local partners. Design workshop has been conducted in September 2015, three working teams were formed to plan for the local services on three aspects, which are (i) Environmental & Hygiene Education, (ii) Water Capture & Filtration, (iii) Water Storage & Quality.

**(ii) Engineering Works Without Borders (EWWB) Team**

20. The objective of this team is to foster the connections amongst EWB-HK and overseas organizations with similar objectives as EWB. The team plans to encourage more experience, knowledge and skill exchanges through projects, group sharing and visits.

21. **Progress:**

On 20<sup>th</sup> June 2015, EWWB team organized a sharing session on the topic of “overseas services trip experience” in the campus of the Hong Kong Polytechnic University (HKPolyU). Representatives from EWB-HK shared the service trip experience in GanSu and the planning of Cambodia service trip; EWB India’s NPTI Chapter shared the services Project Sirohi for providing lighting source to 366 nos. households and Project Samarth for empowering Women self-help groups through biochar making activity; and HK PolyU’s Office of Services Learning (OSL) shared experience on the topic of “Social Innovation and Community Sustainable Development Projects” and HKPolyU’s students sharing on their services trip in Rwanda.

22. On 29~30<sup>th</sup> September 2015, the vice-chairman of EWB-HK participated the Union of International Associations (UIA) roundtable in Bangkok as the representative of both

EWB-HK and EWB-International, which aims to share experience and knowledge on international associations' development.

### 23. The way forward:

EWB has already established connections with EWB Australia, EWB India (NPTI chapter), EWB Singapore, EWB South Africa (University of Cape Town chapter). EWB aims to initiating and organizing sharing sessions, exchange and visits with overseas EWBs and similar organizations in the coming year.

### ***(iii) Waste Management Task Force (WMTF)***

24. In 2014, several young persons and students who were interested in the waste issues formed the Waste Management Task Force. The objectives of this task force are:

- a) To initiate projects related to solving environmental problem in Hong Kong;
- b) To raise the awareness of people on waste reduction, subsequently leading to behavioral change in the society

#### **Progress:**

25 There are two major projects running currently: Laboratory Waste Recycling Scheme; Food Waste Survey and Behavior Change Action. There is also one completed activity: North East New Territories Landfill Site visit

#### Laboratory Recycling Scheme

26. Project Objectives:

- a) Minimize the laboratory waste disposal to landfill;
- b) Raise the awareness of waste reduction and make promotion amongst university students;
- c) Relieve the burden of landfill facilities

27. In this project, WMTF intends to deploy bins for collecting certain kinds of recyclable wastes in laboratories. Guideline and procedures will be prepared for teaching people how to manage and segregate the non-hazardous and hazardous lab wastes. The initial trial period is 3 months. After the bins are set up inside the laboratory (ideally two laboratories at the beginning to test the effect), volunteers will be arranged to help collect the wastes inside the recycle bins and weigh the wastes each week. After a three-month trial, wastes will be weighted, and data will be checked and analyzed.

#### Food Waste Survey and Behavior Change Action

28. Project Objectives: To find out the actual situation of food waste problem in universities and to carry out behaviour change actions.

29. A total of 195 valid responses were collected in the survey and the results evaluated. One

interesting finding is that a majority of people who have leftovers are female. Hence, specific actions should be geared to females in reducing leftovers. As a next step, EWB-HK intends to conduct similar survey in other universities in Hong Kong. Behaviour change action plans will be further developed when more data are collected.

#### North East New Territories Landfill Site visit

30. On 30 May 2015, 20 young persons and HKUST students visited the North East NT Landfill and Landfill Gas Facilities at Ta Kwu Ling Hong Kong. The trip was well received by the participants. The visit let the participants know more about the present situation of waste disposal problem in Hong Kong, such as: how waste is disposed, operation of landfill and technologies like landfill liner system.

#### **31. The way forward:**

In the coming year, WMTF will continue with the two on-going projects in addition to organizing more technical and experience sharing sessions, workshops and visits. For the first activity for the next organization session, WMTF will organize a visit to the EPD Chemical Waste Treatment Facilities at TsingYi on 13 November 2015.

#### **(iv) Student Chapter**

32. With the support from the Centre of Global Engagement (GCE) of the Hong Kong University of Science and Technology (HKUST), a new HKUST Student Chapter was formed on 7 August 2015. The objective of student chapter is to provide a platform for students to learn with first-hand experience on how to solve community challenges with engineering solutions.

#### **33. Progress:**

In the past year, HKUST Student Chapter organized and supported several engineering services information and sharing sessions and Engineering Week Exhibition in the HKUST campus, so as to convey the vision of voluntarily engineering services and the information of EWB-HK projects / activities to HKUST students. The Student Chapter also offered supports to some current EWB-HK projects and activities.

#### **34. The way forward:**

EWB-HK intend to resume the University of Hong Kong (HKU) student chapter and to set up a new student chapter in the Hong Kong Polytechnic University (HKPolyU). They will go on close coordination with their existing volunteers who are studying in HKU and further develop the connections with the Hong Kong Polytechnic University.

## **Webmaster Committee**

35. In May 2015, EWB-HK set up the captioned Committee and the goals as follows:
- a) to coordinate the operation of the web site;
  - b) to monitor the committees of Humanitarian Engineering Challenge, Young Members Group and Water program China in updating their activities and work progress on the web; and
  - c) to find a more user-friendly CMS for future use.
36. After establishment of the Committee, it proposed regular updating of the website, i.e. in one or two months' interval. It will also collect comments from representatives of other committees. The key comments will be substantiated as features to be incorporated in the new CMS.
37. **The way forward:**
- a) To co-ordinate with representatives of other committees for updating of website content;
  - b) To look for suitable vendor, and to negotiate with it for a more user-friendly web site system.

## **Organization & Structure**

38. About the change in registration for EWB-HK from a society to a company limited, EWB-HK had to apply afresh to the Inland Revenue Department (IRD) for exemption of tax, and recently got the approval. EWB-HK have to change the entity to a company limited within three months. Apart from the change of name from the Council to the Board of Directors, there will be no change in respect of work.
39. The Central Filing System Committee completed the work of changing the file names and uploading the backlog of files up to 2013 to the Google Drive. It is expected that the Council Members can upload their own files to the Drive next year.
40. Currently, EWB-HK is entirely operated by volunteers. It is encountering difficulties in planning and running projects and activities. Meanwhile, its monetary deposit is not sufficient for EWB-HK's long term development. Hence, more attention will be paid in the area of fund raising next year.

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