Capacity and Networking Project (CANP): a key issue of the International Commission on Mathematical Instruction (ICMI) at the turn of the 21st century

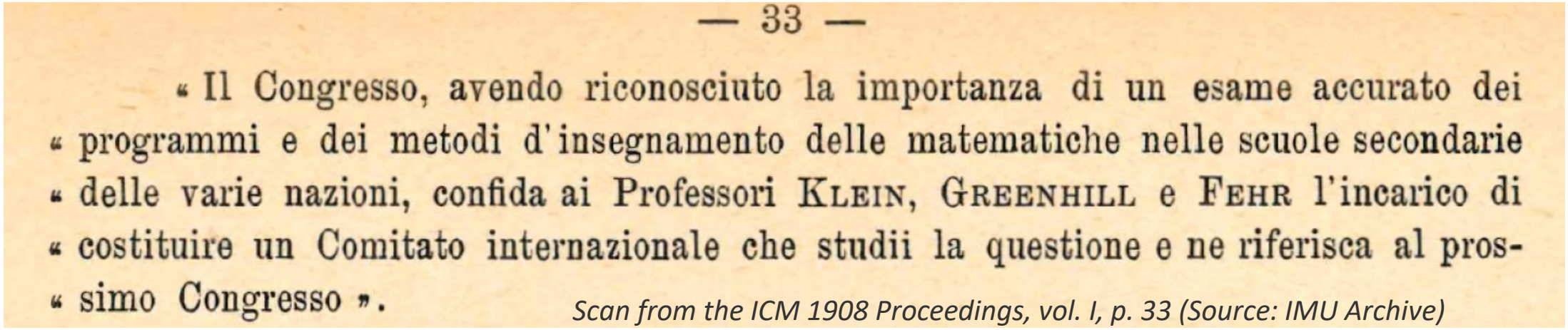
Jean-Luc DORIER

University of Geneva, ICMI Secretary-General

A bit of history

- 1899 **Henri FEHR** (Genève) and **Charles-Ange LAISANT** (Paris) create the journal “l’Enseignement Mathématique”
- 1908 During the 4th congress of mathematicians in Rome creation of Commission internationale de l’enseignement mathématique (CIEM) Internationale Mathematische Unterrichtskommission, Commissione internazionale dell’insegnamento matematico, International commission on the teaching of mathematics. Role of **David Eugene SMITH**. First president: **Felix KLEIN**, Secretary: **Henri FEHR**, vice-president: **George GREENHILL** (UK).   
- **Aim** : inquiry and publication of general report on the current trends in secondary mathematics teaching in various countries

A bit of history



— 33 —

« Il Congresso, avendo riconosciuto la importanza di un esame accurato dei « programmi e dei metodi d'insegnamento delle matematiche nelle scuole secondarie « delle varie nazioni, confida ai Professori KLEIN, GREENHILL e FEHR l'incarico di « costituire un Comitato internazionale che studii la questione e ne riferisca al pros- « simo Congresso ».

Scan from the ICM 1908 Proceedings, vol. I, p. 33 (Source: IMU Archive)

The congress, having recognized the importance of a careful examination of the programs and methods of mathematics teaching at secondary schools of the various nations, entrusts Professors KLEIN, GREENHILL and FEHR with the task of forming an international committee to study the question and report to the next congress.

A bit of history

- 1952 – Re-organization as ICMI which becomes a sub-commission of IMU
- New math reform
- 1960-1980 Mathematics education (didactics of mathematics) becomes an academic field.
- Influence of Hans FREUDENTHAL
- 1968 – International journal *Educational studies in mathematics*
- 1969 – First International congress on mathematical education (ICME) in Lyon (Maurice GLAYMAN) (ICME-14 2021 Shanghai)
- 1985 – First ICMI Study (Jean-Pierre KAHANE and A. Geoffrey HOWSON)
- 2003 – ICMI Awards (Klein and Freudenthal medals) – 2016 Emma Castelnuovo Award
- 2020 – ICMI Awardees multimedia online resources (AMOR)

A bit of history

- 2007 – Michèle ARTIGUE is the first math educator and the first female president of ICMI
- Both with Bernard HODGSON as Secretary-General they shaped the new ICMI, already initiated by Miguel De GUZMAN and then Hyman BASS and Mogens NISS.
- One of the new pillars of ICMI are the activities for developing countries, supported by IMU, CDC and UNESCO.
- It is in this context the first CANP Project was initiated in 2010 in Sub-Saharan Africa under the presidency of Bill BARTON, but with Michèle ARTIGUE as leader.

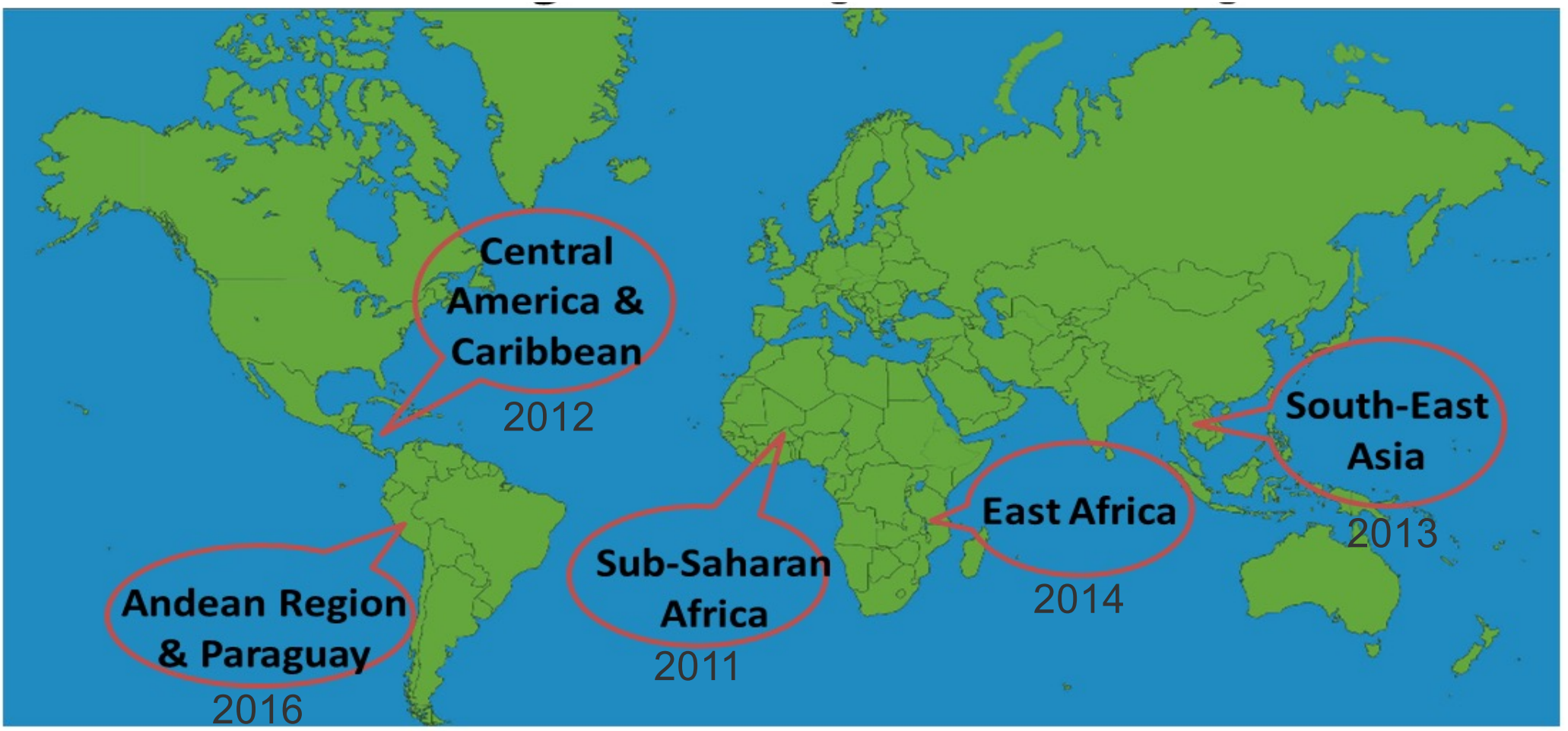
What is CANP?

- CANP is a major development focus of the international bodies of IMU & ICMI in conjunction with UNESCO.
- CANP aims to enhance mathematics education at all levels in developing countries. It develops the educational capacity of those responsible for mathematics teachers, and create sustained and effective regional networks of teachers, mathematics educators and mathematicians, also linking them to international support.

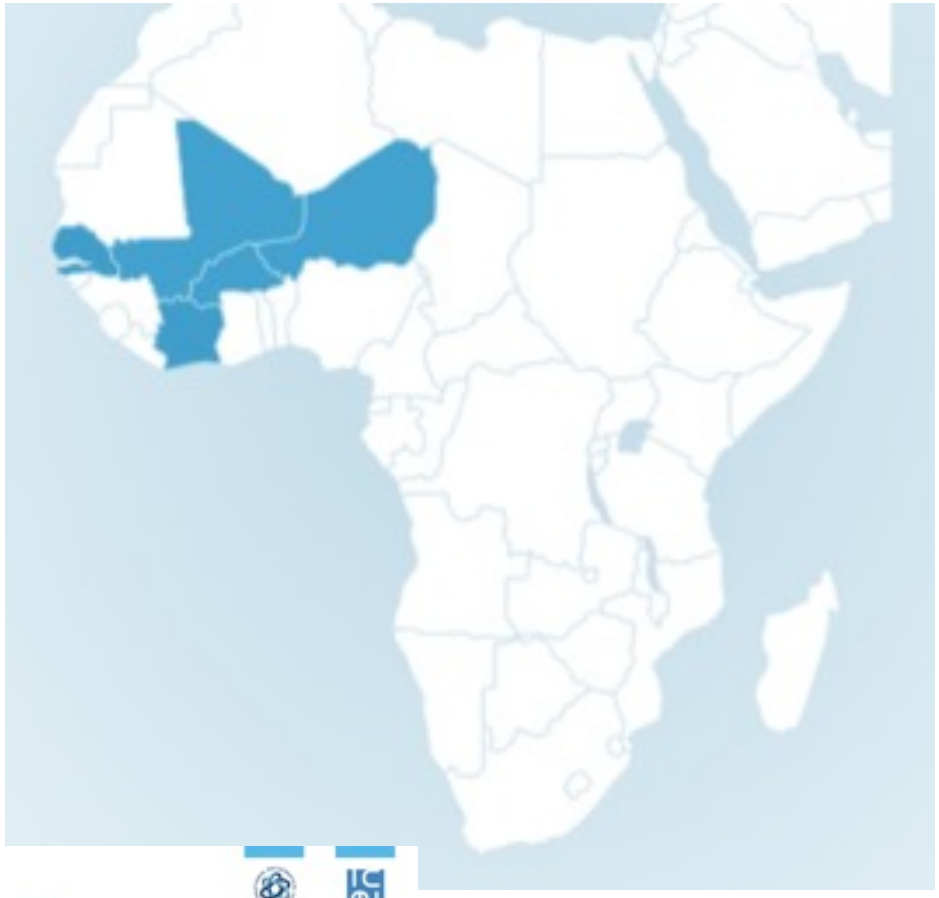
CANP main achievements

- Between **2011-2018, 5 two-week CANP Workshops** and several follow up events have been held: a total of more than **600 participants** from more than **25 developing countries** in five developing regions in Africa, Asia and Latin America.
- In **2015** the ICMI Executive Committee (EC) initiated the **evaluation of CANP 1-5** to provide input relevant to a decision by the ICMI leadership regarding the future of the CANP program series and further activities.
- In 2018 a **CANP Future Workshop** was held with 2 participants from each CANP and the ICMI EC.
- 2019 the CANP Consolidation and Expansion Project was initiated to support and help sustaining the 5 CANP regions.

CANP Regions



CANP1-EDiMaths: Sub-Saharan Africa (initiated 2011)



- 2011: CANP-EDiMath1: first workshop held in Bamako
- 2012: seond meeting and constitution of EDiMATH, a network for the education of mathematics teachers in the sub-region of Western Africa and election of national committee members
- EDIMATHS-3 held March 12 to 14, 2020 in Dakar with 53 participants from 5 countries.

Linked to ADiMA (The association of Western and North African Didactician of Mathematics).

ICMI
Capacity and Network Project

CANP 2 Central America and the Caribbean (initiated in 2012)

- 2012: First workshop held in Costa Rica – Founding of the *Mathematics Education Network of Central America and the Caribbean*. Now members come from 21 countries in Latin America and Spain.
- 2013 & 2017: *Congress on Mathematics Education for Central America and the Caribbean* (CEMACYC) and the General Assembly of new network were held
- Since 2019: semi-annual newsletter on Network activities: "Actualidad REDUMATE"
- Activities via blog and webpage
- Participation in activities from ICMI and its regional multinational agencies.

Linked with IACME (Inter- American Conference on Mathematical Education)

CANP 3 Southeast Asia (Mekong) (initiated in 2013)

- 2013: 1st Workshop held in Cambodia with participants from Cambodia, Laos, Thailand, and Vietnam.
- 2016: Workshop for Cambodian Teachers
- Since 2016 various activities for teachers and educators held in the region

Linked with EARCOME (East Asia Regional Conferences in Mathematics Education)

CANP 4: East Africa (initiated in 2014)

- 2014 : 1st Workshop in Dar es Salaam, Tanzania with participants from Tanzania, Kenya, Uganda and Rwanda-– Creation of regional network of mathematics teacher-educators, collaborating mathematicians, mathematics educators, and mathematics policy-makers in East Africa (East Africa Mathematics Education & Research Network (EAMERN))
- Follow up-workshop in 2015 in Rwanda
- Support of AFRICME-5 (2018) at Aga Khan University in Dar Es Salaam, Tanzania.
- 2018-2021 various networking and academic activities supported by ICMI

Linked with AFRICME (East and South Africa Regional Congress on Mathematical Education)

CANP 5 Andean Region and Paraguay (initiated in 2016)

- 2016: Workshop was held in Peru. More than 100 participants from Boliva, Ecuador, Paraguay and Peru – Creation of CEMAS network (Communidad de Educación Matemática de América del Sur)
- A follow up meeting and constitution of a Mathematics Education Network was held in 2017 in Ecuador.
- In 2020, CANP 5 organized virtual videoconferences on topics related to teacher training in basic education.

Linked with CIBEM (Ibero-american Congress of Mathematics Education)

Has CANP 1-5 achieved its objectives or will it do so in the future?

Lena Koch (IMU Secretariat) wrote a substantial report “Evaluation of the Capacity and Network Project CANP 1-5 of the International Commission on Mathematical Instruction (ICMI)” (see ICMI website)


CANP Mali

Effectiveness

- All five CANP regions have created regional mathematics education networks.
- The networks have organized follow up meetings, conferences and regional activities and visits.
- The regional networks are now or in the process to be linked to ICMIs regional affiliated organizations.

CANP Regions and its links to ICMIs Affiliated Organisations

CANP1-EDiMaths: Sub-Saharan Africa: linked with ADiMA : Association of Western and North African Didacticians of Mathematics

CANP 2 Central America and the Caribbean: Linked with IACME Inter- American Conference on Mathematical Education

CANP 3 Southeast Asia (Mekong): linked with EARCOME East Asia Regional Conferences in Mathematics Education

CANP 4: East Africa Linked with AFRICME - East and South Africa Regional Congress on Mathematical Education

CANP 5 Andean Region and Paraguay: Linked with Ibero-american Congress of Mathematics Education

Impact

What are the overall results of CANP 1-5 (2010-2015)?

CANP Costa Rica and follow up

Impact for participants

The results of the evaluation and the workshop held in Taiwan in 2018 show that the participants valued in particular that they

- learned new teaching methods and topics and improving teaching methods;
- established regional networks and started to cooperate with colleagues from home country and the region;
- learned about assessment of teaching and learning in the classroom;
- have a better understanding of learners behavior;
- started to implement research activities;
- have more interest in research and reflection of teaching;
- started to reflect the mathematics education system.

Impact: General Assessment

- More than 600 people (2011-2018) were directly affected through CANP activities and especially those who participated in the two-week workshop (approx. 200) and teach either in university or school.
- They affect in total several thousand students through their new teaching methods and knowledge about teacher education issues and practices.
- CANP contributes to the achievement of overall objectives of ICMI to *improve the quality of mathematics teaching and learning worldwide* and to *promote the collaboration, exchange and dissemination of ideas and information on all aspects of the theory and practice of contemporary mathematical education.*
- If the new networks keep growing and being active, an impact on the regional development of mathematics education in the CANP regions can be assumed.

Sustainability: Future of the five existing CANP regions and new CANP programmes

- Based on the evaluation, the ICMI EC decided in 2017 to continue further support for CANP and initiated the CANP Consolidation and Expansion Project.
- How should/could existing CANPs be further supported?
- What is the sustainability of CANP?
- New challenges with the pandemic. All CANP have been asked to answer a survey and a discussion group has been held in July 2021 during ICME-14 in Shanghai.

Conclusion

- CANP 1-5 is a successful development instrument, which fosters regional capacity building and network development in mathematics education in the participating developing countries.
- The evaluation showed that there is still work to be done to sustain the results the CANP workshops achieved and to foster the newly established regional networks and the individual members.
- The situation induced by the pandemic shows that the network created through CANP was an efficient instrument to deal with the difficulties.

New challenges

- Enhance and work on the sustainability of existing CANP but also make them autonomous.
- Work on the links with the regional affiliated organizations (benefice of the variety of situations).
- Should ICMI initiate a new CANP ? Where?