

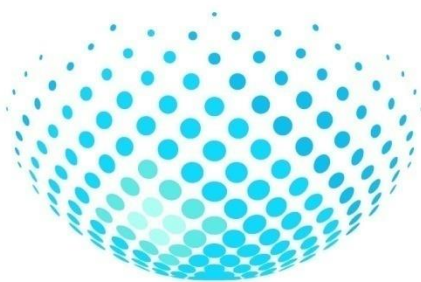


*Workshop for the Implementation of the GGRF in Latin America  
Buenos Aires, Argentina, Sep. 16 – 20, 2019.*

# *Learning and recommendations from the Argentine-German cooperation to install fundamental geodetic observatories*

*Claudio Brunini, Johannes Bouman*

AGGO



Observatorio Argentino - Alemán de Geodesia

**ARGENTINEAN - GERMAN  
GEODETIC OBSERVATORY**

Argentinisch – Deutsches Geodätisches Observatorium



## Site selection

*Instruments work optimally in places that meet special environmental conditions:*

*Electromagnetic silence*

*Low cloudiness*

*No air traffic*

*Stable geology*

*Vibration free ground*

*...*

*These conditions are usually met far from cities, likely in isolated or desert places.*

*Installation at these sites requires expensive infrastructure works:*

*build new roads*

*extend electric lines*

*install optical fiber*

*...*

*S&T salaries are not competitive with industry and working in remote sites multiplies the difficulties for recruiting and maintain qualified personnel.*

*AGGO location: balance between optimality and feasibility.*

*Instruments*

*Electron*

*Low clo*

*No air tr*

*Stable g*

*Vibration*

*...*

*These condi*

*Installation a*

*build ne*

*extend e*

*install op*

*...*

*S&T salaries*

*multiplies the*

AGGO



*conditions:*

*desert places.*

*sites*

*l.*

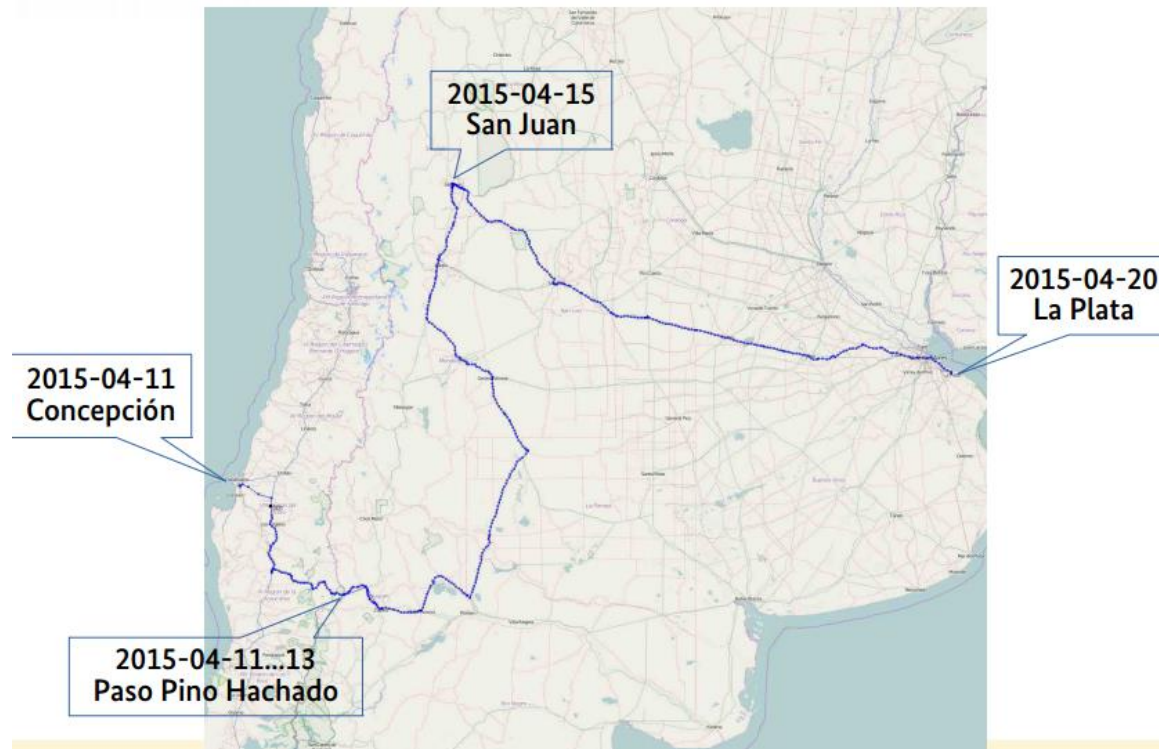


## Customs procedures

*Are very complicated and procedures change every so often*

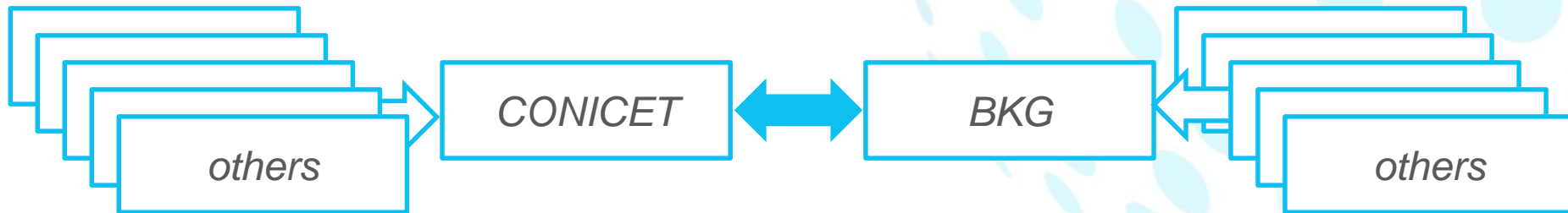
*Customs are not prepared to process non-standard equipments*

*The project must allocate personnel and time specifically for handling import/export procedures.*



## Only one partner per country

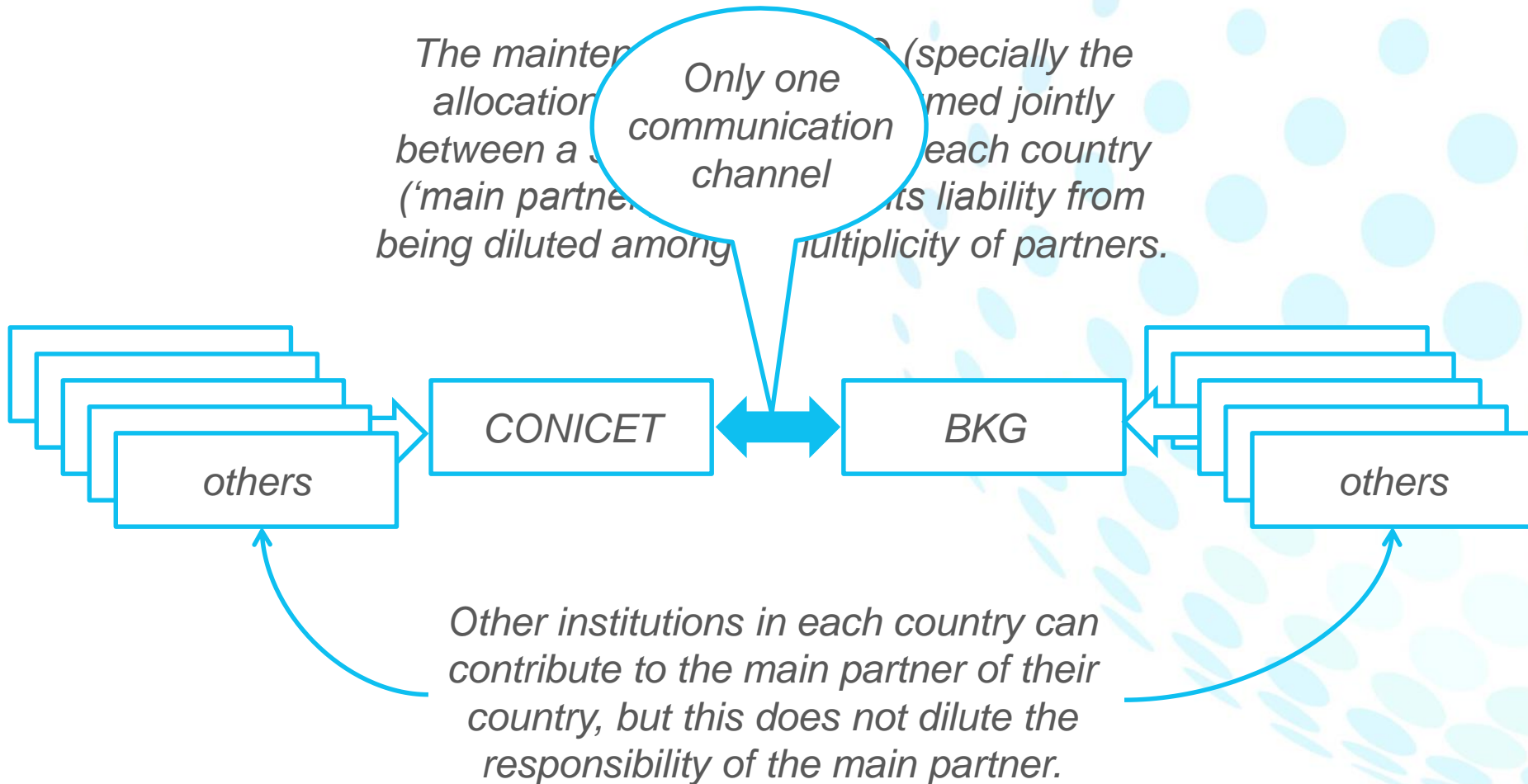
*The maintenance of AGGO (specially the allocation of budget) is assumed jointly between a single institution in each country ('main partner'). This prevents liability from being diluted among a multiplicity of partners.*



*Other institutions in each country can contribute to the main partner of their country, but this does not dilute the responsibility of the main partner.*

## Only one partner per country

The maintenance of the observatory (specially the allocation of resources) is performed jointly between a main partner and other partners of each country ('main partner' and 'others'). This avoids its liability from being diluted among the multiplicity of partners.



Other institutions in each country can contribute to the main partner of their country, but this does not dilute the responsibility of the main partner.

## *Involvement of the national community*

- *AGGO's first commitment is to produce data according to international standards.*
- *Complying this ensures a good impact of AGGO in the international community.*
- *Will this achievement be enough to sustain Argentine investment in the long term? → Establishment of a UN-GGIM trust fund may be crucial*
- *The acceptance of the international community is a sine qua non condition, but it is also necessary to get the national community involved in the use of AGGO.*
- *AGGO should not only be concerned with the production of high quality data, but also with motivating the national community in projects based on its data.*

# *Involvement of the national community*

*The geodetic community of Argentine is distributed in:*

## ***Technical organizations (mainly in Buenos Aires)***

*National Geographic Institute (IGN)  
Hydrographical Service (SHN)  
Metrologic Entity (INTI)  
Space Agency (CONAE)  
Institute for Antarctic Research (IAA)  
Institute of S&T for Defense (CITEDEF)  
...*

## ***Universities (throughout the country)***

*La Plata (UNLP)  
Buenos Aires (UBA)  
Cuyo (UNCu)  
Rosario (UNR)  
San Juan (UNSJ)  
Santiago del Estero (UNSE)  
Tucumán (UNT)  
Córdoba (UNCo)*

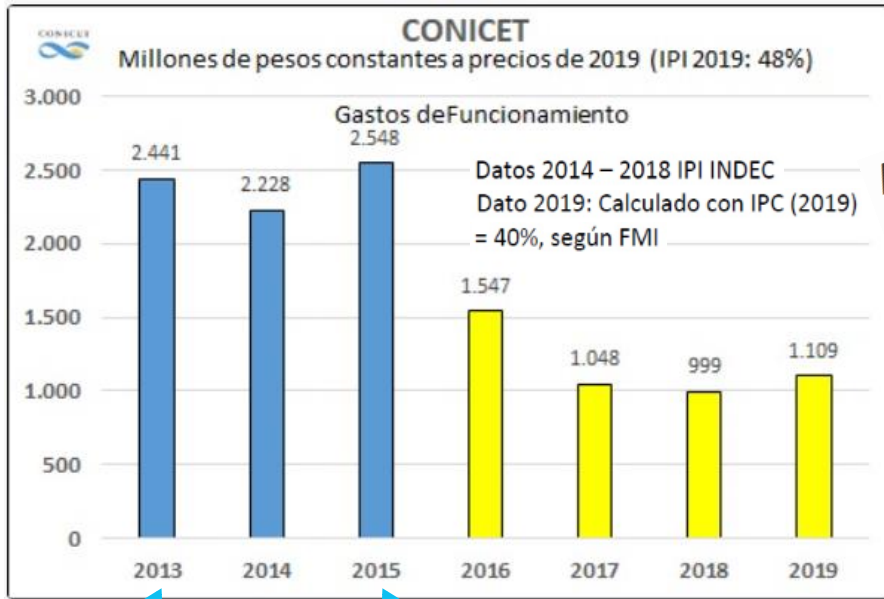
*Let's try to get the community to go to CONICET to speak in favor of AGGO*



## *Capacity building is a key target*

- *The experience for taking advantage of AGGO data is incipient in the region.*
- *The ability to process SLR or VLBI data regularly is not yet developed (in fact, national reference frameworks are based entirely on GNSS data).*
- *Strengthening these capacities will contribute to the sustainability of AGGO.*
- *International cooperation is needed to expedite the capacity building process.*
- *Concrete examples are:*
  - *The transfer of knowledge from BKG to the Argentinean IGN for installing processing and combination centers for VLBI and SLR;*
  - *The 'SLR in Latin America' workshops that are being conducted with assistance of BKG;*
  - *The LAPIS School that have been developed in 2017 in La Plata;*
  - *The Regional School on Geodesy that is being proposed by the UNLP.*

# A threat difficult to face



*Austerity cuts threaten future of science in Argentina*

Lindzi Wessel  
Science 03 May 2019:  
Vol. 364, Issue 6439, pp. 419  
DOI: 10.1126/science.364.6439.419

## Summary

Thousands of scientists from labs across Argentina stayed home on 30 April, joining a nationwide strike against the government's latest round of austerity measures, according to research institute heads. In the latest blow to the country's science system, the National Scientific and Technical Research Council, which employs more than 20,000 researchers in hundreds of centers, announced on 5 April that it had a mere 450 new first-time investigator positions available for this year's roughly 2600 Ph.D. graduates—leaving a record number of trainees without jobs. Meanwhile, labs are struggling to pay for equipment, reagents, and cleaning.

*Buying and maintaining the instruments are efforts that Argentina could hardly face -> international cooperation is essential.*

*Signing of the agreement*

*Opening of AGGO*

*Argentina made an important initial investment for infrastructure (including land and construction costs) and for personnel. Since the change of government (2015-2016) the budget for the operation was maintained but the funds for investments were reduced. Political changes and economic instabilities are difficult to predict -> the probability of occurrences cannot be ruled out and partners must prepare for that venture.*

## Horizontal cooperation

- *International cooperation is important not only for the contribution of the instruments and their maintenance.*
- *It is also important for transferring of knowledge for the administration, technological developments and scientific use of the observatory.*
  - *The participation of Argentinean scientists in the international bodies where the operation of AGGO is coordinate is quite limited; it has to grow in the future.*
  - *AGGO engineering staff demonstrated high level of professionalism, but the expertise for maintain and updating the instruments takes time to develop.*
  - *Cooperation with the international community is needed to foster the involvement of the Argentinean community in the use of AGGO.*
- *BKG maintains two experts permanently in Argentina and supports several scientific and capacity building activities.*
- *Dividing the work between those who put the 'workforce' and those who put 'the know-how' can be comfortable, but it is unsustainable in the long term.*

## Cultural differences

- *The differences between ‘developed ‘and ‘less developed countries’ go beyond economic capabilities or S&T development.*
- *They include, among others, the maturity of institutional practices, e.g.:*
  - *Written agreements do not automatically translate to facts, periodical negotiations and re-negotiations are required;*
  - *There is little awareness that a project does not end with the initial investment; that long-term maintenance is even more demanding than initial investment;*
  - *Deadlines always lengthen.*
- *Cultural differences between persons also constitute a barrier for the progress of complex projects.*
- *Developing strategies for dealing with these kind of problems could be included in a ‘Lessons Learned’ document related to the GGRF Implementation Plan.*
- *AGGO could provide its ‘expertise’ developed in practice.*