

THE ISI SCB STRATEGY AND ACTION PLAN 2019 - 2021 AND BEYOND

Mission

The ISI's Statistical Capacity Building activities aim to develop the capacity of individuals and organizations to increase the impact of Statistics and Data Science.

Vision:

Statistical Capacity Building is one of the ISI strategic priorities for 2019-2021 and beyond. The ISI envisions strong, mutually beneficial collaborations between ISI and its Associations with statisticians and practitioners involved in academic and research institutions, official Statistics, business and industry, environmental agencies and everywhere Statistics is involved, including Data Science programs. Through a multifaceted approach with several partners, ISI will facilitate activities to develop the capacity of individuals and organizations to improve the way Statistics is used to provide solutions for business and industry, public sector and civil society and integrate their needs into academic curricula, in particular in support of the Sustainable Development Goals (SDGs). Within this, we will encourage interdisciplinary learning between professions related to statistics to ensure Statisticians and Data Scientists adapt well to our changing world and its statistical challenges.

Objectives:

The ISI Taskforce on Statistical Capacity Building proposes short-, medium-, and long-term activities to develop the capacity of individuals and organizations to increase the impact of Statistics and Data Science. Such split is motivated by practical reasons, i.e. the short term activities are the ones on which it is feasible to start working (almost) immediately but they have to be considered in a context of a longer term planning, with an evident link and continuity between what is planned for now and what is planned for the future.

The different categories (ISI, Official Statistics, Business and Industrial Statistics, Environmental Statistics, Education) have been introduced to better specify the activities within each of them but it is evident that Education is across all of them and other statistical fields are involved (e.g. survey sampling, computational statistics) and more specific objectives could be specified for them, especially in cooperation with ISI Associations.

For each of the categories, the following high-level objectives are foreseen:

ISI

1. Develop a work plan which coordinates the work and budgeting of the ISI in capacity-building with the global statistical system, ISI member organisations, and potential external funders
2. Focus the support on different statistical fields, while encouraging learning across relevant professions and sectors
3. Ensure the work plan supports the challenges of the Sustainable Developments Goals (SDGs)

Official Statistics (but applicable also to other fields, like Survey Sampling)

1. Develop open source courses for improving the capacity of official statisticians and provide teaching to targeted countries/regions
2. Improve the governance and leadership skills of managers in official statistics
3. Promote expansive approaches to building capacity that improve official statisticians' capacity to work with Data Scientists, and vice and versa, and learn from other professions
4. Improve capacities in relation to emerging specific challenges for official statisticians, such as working in partnership with the private and other sectors

Business and Industrial Statistics, Environmental Statistics (but applicable also to other fields)

1. Increase the supply of well-trained and qualified Statisticians and Data Scientists who can work together and apply statistics and data science to solve statistical problems and support data-driven decisions in business and industry
2. Increase the demand for Statistics in business and industry, and in environmental protection and research
3. Strengthen ISI's capacity to facilitate statistical capacity building activities and collaborations

Education

1. To support ISI's long term positioning as the global reference point for anyone looking to improve their statistical or data skills
2. Develop good practice case studies/models of how to build statistical capacity at scale

3. Use small capacity-building initiatives to start building a team of experts, collection of open educational resources and experiences in low income environments
4. Support educational activities that prepare Statisticians for high impact in different sectors

Principles:

For an organization as diverse as ISI a framework guiding its activities is a must to achieve coherence in SCB activities. However, given the individual expertise of ISI members, this framework shouldn't be prescriptive since that would reduce effectiveness. Guiding principles potentially strike a balance of communicating common values without enforcing specific protocols.

- **Collaborative by nature.** This principle is natural for ISI as it inherently exists as a collaboration between its members (ISI and Associations). Important implications of this principle include the fact that wherever possible ISI should be working with partners for local implementation and making itself attractive as a partner in statistical capacity building initiatives. **Collaboration** is the key. ISI must collaborate with individuals, organizations, and other institutions to achieve its statistics capacity building goals. In doing so, it should encourage collaboration between organizations and professions. At the individual level of statisticians working with non-statistics domain experts, **statistical collaboration includes all the best aspects of statistical consulting** to help domain experts answer their research questions or make data-driven business or policy decisions.
- **Accepting complexity.** Given ISI's global remit, complexity is unavoidable at the largest scale. One consequence of accepting complexity is the exclusion of silver bullet solutions and quick fixes, adopting instead a more multifaceted trans-disciplinary approach to interventions.
- **Scalable Impact.** This principle should be central to ISI thinking. It pushes thinking to go beyond just finding individual solutions towards understanding how those solutions can be replicated. In this respect, we should have a particular focus on helping find solutions to the challenges of the SDGs.
- **Building incrementally.** Interventions need to be thought of as steps along a path, rather than a jump. Even drastic change can be achieved incrementally.
- **Open by Default.** This principle would affect both the inputs and output of the ISI capacity building initiative. It implies that when a valid justification exists then no negative judgement is given to traditional commercial approaches, but

the default approach is an open licence, which is free to access, edit and distribute for education.

- **Bottom-up and context-driven development-** This principle aligns well with ISI as a member-based organisation supporting the individuality and initiative of its members. It can empower communities both for today and the future while enabling interventions to adapt. **Local innovation** is necessary to adapt ISI activities to local contexts. This principle challenges interventions to recognise that different options are needed for varying contexts.
- **Continually evolving.** This principle both guards against complacency and stimulates innovation. Practically it can translate to an expectation of adaptation whenever an intervention is repeated in space or time.
- **Practical vs theoretical knowledge.** Universities should **graduate students who are ready to contribute** to business and industry, environmental protection and research, public sector and civil society meaning they have the necessary technical and professional skills and practical experience collaborating with domain experts to apply Statistics to solve real-world problems. Business and Industry, official Statisticians, environmental agencies also need to take a rounded view of the skills a Statistician should develop, looking towards multi-disciplinary learning and skills that enhance Statisticians' ability to interact effectively with other professions and non-technical actors in society.
- **Monitoring and evaluating quality.** ISI statistics capacity building activities should be **monitored and evaluated** to ensure progress and document evidence regarding the effectiveness of its activities and practices
- **Linking to SDGs monitoring.** Cape Town Global Action Plan for Sustainable Development Data states: "capacity building is important for all countries, even more so for developing countries, particularly African countries, least developed countries, landlocked developing countries, small island developing States and middle-income countries and other countries in vulnerable situations". Wherever possible, SCB activities should aim to promote capacity development in areas / topics which would support the SDG goals and measurement of their achievements
- **Co-ordinating with SCB donors and with other SCB actors.** There are many players in the field of the SCB. The ISI has to find its niche while at the same time has to be well informed about the other SCB initiatives. As the ISI is one of the founders of Global Network of International Statistical Training (GIST) this is an opportunity for better co-ordination in the field of the SCB.
- **Exploring the options to work in public-private partnership.** To improve capacity a lot of expertise is needed, while funds need to be leveraged and utilised as efficiently as possible.. It is important that all players in the field learn how to work together. In developing our activities, we should explore if and how PPPs can assist in achieving our Objectives. In general, ISI shall start discussing collaboration with Universities, national statistical agencies and private consulting firms how to cooperate in capacity building initiatives.

- **Sharing best practices.** Best practices in statistical capacity building should be shared and disseminated throughout ISI: It should be known who is doing what and advertise what/how to get involved, especially attracting young people to contribute.

This document and annexes with more detailed explanations of proposed activities, definitions and principles were prepared by the SCB Task force: Fabrizio Ruggeri, Irena Krizman, Pedro Silva, Eric Vance, David Stern, Misha Belkindas and Ada van Krimpen. The contribution by Matthew Shearing is also acknowledged.

List of the activities proposed by the ISI SCB Task Force

ISI

SHORT TERM

#	What	How	Who
1	List of ISI members willing to contribute to SCB	Questionnaire sent to members asking for their will and additional information (teaching /hosting/distance mentoring, course/Ph.D. advising and topics, target of Master/Ph.D. students/researchers/practitioners, possibility of self-supporting, language)	ISI and Associations through SCB Committee
2	Identification of needs and interested people	Connect with GIST's mapping of gaps and needs for SCB. Questionnaire sent to members and participants of ISI activities to check their interest and connection with other possible interested people	ISI and Associations through SCB Committee
3	Contacts with RSS and ASA to discuss about common activities	Contact with people in charge of SCB within ASA and RSS	SCB
4	Contacts with WB, AfDB and Asian Development Bank	Continuation of the current cooperation, proposing activities beyond WSC	ISI (President and PO)
5	Contacts with UNSD and GIST to enlarge partnership with other groups involved in them	Participation to their activities and committees	ISI (President, PO and everyone involved in them)
6	Contacts with UN regional bodies, UNECE, Paris21 and Global Working Group on Big Data	Contact	ISI SCB Committee
7	Start of a library of available resources	Search for video, tutorials, software to be either stored or linked at an ISI ad-hoc webpage (after asking owners for permission)	Group of ISI volunteers under SCB direction
8	Contacts with Eurostat and EFTA		ISI (President, PO)
9	Contacts with ESRI	Continuous cooperation (governance workshops)	ISI SCB Committee
10	Spread of information on relevant opportunities	Creation of two mailing lists (providers and recipients of services) to which send very few messages about relevant opportunities (e.g. courses, need for teachers, calls for funding like the WB for the ISI WSC)	ISI SCB Committee

1 1	Appointment of a new, small and motivated SCB committee, with diverse expertise		ISI
1 2	Initiate discussion with private consulting firms and national statistical agencies on ways of working together	Hold webinars to discuss good practices, agree on modus operandi, if needed formalize relationships	ISI SCB Committee
1 3	Develop and revise the Action Plan	Assess inputs and progress from above activities and refine action plan according to available resources	ISI SCB Committee

MEDIUM-LONG TERM

#	What	How	Who
1	Partnership with funding agencies	Direct contact (possibly through people connected with them) proposing detailed activities and participating to grant calls, if any	SCB, ISI and its Associations. Targets include Mastercard, Google, Gates Foundation, Carnegie Foundation
2	Volunteer Lecturer Program (like the International Mathematical Union)	Partnership with major statistical associations (especially RSS and ASA) and contributions by ISI and Associations' members	SCB, RSS, ASA, ISI and Associations
3	Library of available resources	Website (like ArXiv, but monitored) where people can submit their tutorials, videos, software, etc.)	Group of ISI volunteers under SCB direction
4	Monitoring of medium term impact of ISI and Associations' activities	Setup of guidelines and a review process to understand if SCB activities have had an actual impact	SCB, ISI and its Associations

Official Statistics

SHORT TERM

#	What	How	Who
1	Develop / adapt courses for a selection of topics aiming to 'close the gap' in competences, since many people in Official Statistics have no strong statistical background and/or are in need to broaden their skills	Recruit support from partners and volunteer members Fund with World Bank & other donors' support	IASS; IAOS; University of Southampton; Statistics Canada; Statistics Netherlands; University of Michigan; IBGE/ENCE; University of Edinburgh
2	Teach these short courses for a selection of countries / regions, aiming to assess, smooth and perfect the course materials developed		IASS; IAOS; University of Southampton; Statistics Canada; Statistics Netherlands; University of Michigan; IBGE/ENCE
3	Develop MOOC versions of the above mentioned courses		UNSD + GIST
4	Teach the MOOC versions of the above mentioned courses, and assess the experiences.		UNSD + GIST

5	Governance workshops for the high level managers of the National Statistical Offices and other important stakeholders	Sharing best practices and building a community of innovative and forward looking leaders in Official Statistics (in Africa, Asia and Latin America)), including in building partnerships and effective business models with other sectors	ISI, IAOS, IASS in cooperation with NSOs, Central Banks, ECA, ESCAP, ECLAC, donors, AfDB, WB TF and other SCB partners)
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MEDIUM-LONG TERM

#	What	How	Who
1	Expand the process to include additional topics as needed		
2	Expand the process to enable presentation of the courses in languages other than English		
3	Continue with the governance workshops for the high level managers of the NSOs and other stakeholders	By providing an independent platform for sharing good practices and innovative solutions	ISI, IAOS, IASS in cooperation with NSOs, Central Banks, donors, AfDB, WB TF and other SCB partners.

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Business and Industrial Statistics

SHORT TERM

#	What	How	Who
1	Development of technical skills (statistical theory, methods, applications, and programming skills)	Continuation of ISBIS technical workshops	ISBIS
2	Development of professional skills (communication, collaboration)	Creation of workshops, possibly at WSC and RSC	ISBIS, Eric Vance
3	Increase awareness of good statistical practices especially among young people	Competition like IASC “Data Analysis Competition” and R summer schools on practical applications in business and industry	ISBIS
4	Increase interaction between academia and business	Sponsor video/talks by people in B&I in universities, start developing case studies, and pilot one program at a statistics department to reconnect with alumni in business and industry	SCB, ISBIS

MEDIUM-LONG TERM

#	What	How	Who
1	Increase interaction between academia and business	Program of talks and webinars by people in B&I and library of their interventions, library of case studies, one week "industrial statistics" working group workshops	
2	Improvement of software skills	Introduction to R in Portuguese, French, Spanish and English (from Africa)	SCB, Coursera

Environmental Statistics

SHORT TERM

#	What	How	Who
1	Development of technical skills (statistical theory, methods, applications, and programming skills)	Creation of workshops and short courses, possibly at WSC and TIES	TIES
3	Increase awareness of good statistical practices especially among young people in environmental agencies	Summer schools on practical applications in environmental research and protection	TIES
4	Increase interaction between academia and environmental applications	Involve environmental engineers and officers in TIES meetings	TIES

MEDIUM-LONG TERM

#	What	How	Who
1	Training of Statistics teachers	Courses at local level or at WSC, TIES and similar events	ISI (?), TIES
2	Improvement of software skills	Introduction to R in Portuguese, French, Spanish and English (from Africa)	SCB, Coursera

Education

SHORT TERM

#	What	How	Who
1	Improvement of data skills	Preparation of some very detailed case studies to be used in class (teachers possibly instructed in advance through visits or video conferences), providing thorough illustration of the problem at hand (possibly of local interest), data collection and check for quality, stochastic modelling in all its aspects (model choice, inference, goodness-of-fit, validation, etc.), findings and their reporting	Group of volunteers under SCB direction
2	Improvement of existing open educational resources	Review of existing open educational resources, along a set of guidelines	Group of volunteers under SCB direction
3	Training of statistics teachers at WSC, RSC, ICOTS, etc.	Organisation of courses for teachers at WSC and other events with many people from developing countries, with possible videotaping of those courses	ISI in cooperation with conference's organisers

MEDIUM-LONG TERM

#	What	How	Who
1	Improvement of data skills	Library of very detailed case studies to be used in class (teachers possibly instructed in advance through visits or video conferences), providing thorough illustration of the problem at hand (possibly of local interest), data collection and check for quality, stochastic modelling in all its aspects (model choice, inference, goodness-of-fit, validation, etc.), findings and their reporting	Group of volunteers under SCB direction to prepare case studies and review contributions by other researchers

2	Accreditation of open educational resources to identify high quality educational resources and assemble them into usable collections	Set of guidelines to be followed and review by a panel about the compliance of open educational resources	Committee setup by ISI in cooperation with other societies (like ASA and RSS)
3	Increased attendance to events like WSC and ICOTS	Matching programme with funding partners so that they support as many people as ISI, in exchange for some visibility at the event. Opportunity to organise also free training courses for teachers at WSC, ICOTS et al	ISI and funding agencies
4	Training of Statistics teachers	Courses at local level or at WSC, RSC and similar events and collection of training videos	ISI in collaboration with organisers