

Summary of Proceedings of the Project Inception Meeting

On MAPPING THE CULTURAL AUTHORITY OF SCIENCE ACROSS EUROPE AND INDIA (MACAS-EU & INDIA 2012)

Date

22-24 November, 2012

Venue

Conference Hall, Indian Council of Social Science Research (ICSSR), New Delhi,
India

Participating Institutions



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE



Funding Institutions



Summary of Proceedings of the Project Inception Meeting on “Mapping the Cultural Authority of Science across Europe and India” (MACAS-EU&INDIA)

22nd- 24th November, 2012 at ICSSR, New Delhi

Project on Mapping the Cultural Authority of Science across Europe and India (MACAS), supported by ICSSR-ANR-DFG-ESRC-NWO, a kick-start meeting of leading collaborators and concerned researchers was organized during 22nd-24th November, 2012 at Indian Council of Social Science Research, New Delhi. The meeting was aimed to discuss the three basic modules of the study namely, comparative analysis of EU-India survey data, Media Analysis 1990-2010, and qualitative case study of Science Culture and accordingly finalize the work-plan for the next three years. The meeting concluded with presentations and brainstorming sessions as well as also focused on the pressing questions that need urgent attention to make this multilateral research collaboration more policy relevant.

The meeting had participants from different disciplines including scientists, sociologists, statisticians, social psychologists, linguists, economists, media and IT professionals. The *inaugural session* gave an overview of MACAS research project and its potential. In the backdrop of the roundtable discussions on culture of science held in 2007 (Royal Society, London); 2008 (Delhi, Sao Paulo/Campinas); 2009 (Hiroshima, Japan); 2010 (Beijing, Delhi); 2011 (*Culture of Science* Book, Routledge Publications), the issues of science in the media, science in the public sphere and science in the society were discussed. The role of cultural mobilisations in promoting scientific temper, scientific literacy and public understanding of science was also elucidated and considered as the most important. The audience was briefed about the various indicators of science culture as well as database of such studies (e.g. India Science Report 2004; National Youth Readership Survey 2008; UK's Eurobarometer 1989-2005). With regard to determine other forms of indicators to study the attitude of general public, reference was made to agencies like mass media, who can play a vital role.

The inaugural session was followed by two thematic sessions and one brainstorming session. Work plans under the three modules were finalised on the third day. **Session I** had presentations and discussion on *Overview of Past Work*, which covered the conceptual and methodological framework of 'S&T Index' construction, benchmarking of 'Science Culture Index' (SCI), testing its reliability and validation and data integration from 'Gesis Data Catalogue'. Both objective (R&D, number of personnel, patents, innovation, balance of hi-tech trade) and subjective indicators (knowledge, attitudes, interest, informedness, engagement) of Science Culture have been discussed in 'India Science Report', which has advocated for the construction of a composite indicator, and cautioned against misleading policy messages emanating from poorly constructed indices. The societal conversation of science could be mapped through the

following methods: (i) consolidation of public understanding of science (PUS) databases worldwide; (ii) construction of global indicators; (iii) mobilising complimentary data streams.

A statistician's perspective was given in the creation of the core EU dataset on PUS by harmonizing and integrating common indicators (public engagement, interest, knowledge and attitudes of the general public in Europe, demography) through five Euro Barometer surveys 1989, 1992, 2001, 2002 and 2005). A set of new identification, regional and weighting variables were also generated using original identification, regions and weighting variables of all the five rounds. Precautionary efforts while integrating/harmonizing selected variables were also addressed. The result of the exercise is one comprehensive SPSS/STATA file, which shows the trend of PUS in Europe (1989-2005).

Another significant area addressed at the session was the role of cultural mobilisations and cultural practices in constructing science culture in regional settings. The historical background of the notion of 'scientific temper' as well as the role of comparative tradition of cultural mobilisations towards PUS in diverse contexts was explained. Empirical accounts described that India registers a different kind of mobilisation (e.g. people's science movement) as well as public debates and how such mobilisation efforts has fostered scientific temper across the country. This presentation appropriately revisited the Nehruvian concern of scientific temper and explained the synergy between scientific temper and PUS movement. A focus on whether the context/meaning of scientific temper changes, which is in part the footprint of PUS activities, was also recommended. The session was concluded with a discussion on how best scientific temper can be operationalised and measured across varying contexts, and to what extent public map science.

Session II on *Work and Ideas for Development* commenced with the presentation on " para-scientific beliefs and literacy in Taiwan" which *inter alia* explained how to interpret unexpected results as cultural indicators. This presentation covered a broad spectrum of scientific literacy waves during 2008 and 2012. Based on the sampling method of 3 stage-probability proportional to size (PPS) sampling design, this study sought to examine the relationship between scientific knowledge and the traditional knowledge of fortune-telling belief and practices. It was based on a trend analysis of fortune-telling practice in Taiwan from 1985-2012. The analysis showed that scientific knowledge was null or negatively associated with the beliefs that divination, fortune-telling, or horoscopes can predict the future. However, on the other hand, scientific knowledge was null or positively associated with actual engagement of fortune-telling practices. The discussions were linked to risk choices, psychology of dependence on authority and media domination.

The second presentation of this session pertained to some important questions about item missingness in datasets, particularly on why and under what conditions missingness occurs and the patterns of missingness. An introduction to the procedures to deal with missing items was also given. In order to strengthen the existing datasets, it was suggested that single and multiple imputation be utilized, especially in PUS Euro Barometer at the level of MI knowledge item and MI knowledge scale. Certain

vital questions were posed in the meeting which included: (i) imputation item by item, imputation of summative scale? (ii) which items to imputed first? Does the order matter? (iii) knowledge-scale: metric or ordinal? (iv) how best to estimate descriptive statistics? (v) how to make available for users? It was stressed that a sensitivity analysis (with or without imputations) is required in the next step of research. A suitable method of imputation has to be decided to apply to the data like single regression imputation/conditional mean imputation/maximum likelihood method/multiple imputation etc.

Follow-up to the Day I, the **Day II** of the meeting had presentations on **discourse analysis of science in public forums and text-mining for science indicators**. The first presentation on discourse analysis dealt with climate change communication between science, politics and the mass media in Germany. This presentation raised two leading questions: (i) how is social perception of anthropogenic climate change constituted by scientific, political and mass media discourse? (ii) how does this selective problem perception generate a specific set of problem solving activities, whereas others get 'out of sight'? To explore these, database was drawn from various discourses (e.g. scientific, political and media). How to contextualize science and technology thematically was also discussed.

The crucial role of contextualization of S&T was highlighted. In other words, how S&T appears in socio-cultural context. Different kinds of qualitative analysis through media monitoring were elaborated and the need for text-mining explained. Stressing upon the preparation of a manual comprising of some basic concepts like standardized definition of S&T, the ideas about scientific culture, scientific way of thinking, scientific mentality, scientific temper, etc. were shared. Later, how to build a corpus of S&T news through the adoption and application of software tools like SAPO, QDA-Miner and WORDSTAT was discussed. It described media selection (e.g. which media, popular or social), drawing a representative sample (e.g. popular/marginal, if popular newspapers, then which newspapers and how many articles from these newspapers), standardising the thesaurus through defining the boundaries of S&T (probably deductive/inductive, else a combination of both, for example UNESCO classification, 1978), determining keywords (knowledge engineering/machine learning) as well as using human-selected seed words in conjunction with a very large text corpus.

The **Session II** revisited the notion of scientific temper in Indian context and an elucidation was given on how scientific temper has been a hazy idea. Immediately there was an open brainstorming on whether additional data to be considered in each context particularly secondary data, new data to be collected in each context, defining realistic objectives within the funding limits, chalking out concrete steps for the deliverables followed by exploring potential and purpose of exchange visits.

Day III focused on the module-wise work plan for the 3-year period of the project. The following tasks were finalized.

Tasks for MODULE 1: PUS/ Science Culture Index

- I. Joint EU-India database (1990-2010) and other database
 - EU data (1989-2010), EU-India (2005)
 - EU Biotech data for 6 rounds (1993-2010)
 - US datasets (1983-2002)
 - Gauhar Raza (1989, 2003, 2007)
 - Taiwan datasets (2008, 2012)
 - Education survey datasets e.g. ROSE (Europe), ASER and PROBE (India)
- II. Index cross-validation
 - Comparing different indices in terms of the methodology adopted at SCI (India), CDI (India), CSLI (China), SLTI (Taiwan)
 - Validating by doing sensitivity analysis, checking reliability, robustness.
 - Prepare a white paper explaining the procedure and methodology of conducting sensitivity analysis (IASRI).

Tasks for MODULE 2: SMM/Mass Media Monitoring

- I. Corpus of science news (1990-2010)
- II. SAPO- software for Text Mining
 - *Adopting this system to India/UK/Germany for Corpus construction*
 - *Preparing a thesaurus related to science and technology e.g. UNESCO*
 - *Deciding about the newspapers to be selected i.e. regional/national or both*
 - *Number of articles*
- III. Defining an efficient procedure for selecting items for text mining (sample strategy)
 - *Statistical Procedure for selection of the articles*
 - *Accessibility of the articles*
 - *Deciding about the maximum amount to be kept for articles.*
- IV. Discourse analysis
 - *Preparing data for 'softwares'*
 - *Application through QDA Data Miner+ WORDSTAT*

Tasks for MODULE 3: PES/ Comparative Qualitative Case Studies e.g. rural-urban. Six case studies to be conducted in rural & urban areas focusing on determining awareness regarding science and technology. Rural/urban differences within India; not rural/urban India with rural/urban UK and Germany.

- I. Secondary data
 - *Substantive topic with defining objectives*
 - *Use of all possible available secondary data related to S&T*
 - *Reviewing existing literature at state/regional/national level*
 - *Access/cognitive structure*
- II. Primary data
 - *Through focus group discussions (FGDs)*
 - *Reaction to controversial news through questionnaire approach*
- III. Video/image material
- IV. Comparative analysis
 - *Small comparison*
 - *Revisit super-science hypothesis*
 - *Prepare a white paper for publication in this regard.*
 - *Human resources to be allotted for a comparative analysis of data.*
- III. New Survey
 - *Develop a format for a new survey to everyone*
 - *Revisit super-science hypothesis*
 - *Prepare a white paper for publication in this regard.*
 - *Human resources to be allotted for a comparative analysis of data.*

Throughout the two and a half day deliberations, a major concern voiced repeatedly was the absence of qualitative case studies on science culture across India, UK and Germany. The kick-start meeting was seen as a prelude to an engagement with this excellent research project which explores the science culture in this *relative* PUS age. It also did familiarise with competences in the teams. Further, it was decided that:

- (a) An advisory board would be constituted for the overall smooth functioning of the project.
- (b) Team members are requested to consider for the preparation of manual providing the guidelines on how to work.
- (c) Attempt would be made to ascertain whether there is any need for additional human resources. If necessary, then for which module/ sub-section and how many, may be made later.
- (d) On the matter of Module 2, Ahmet & his team would supply necessary assistance to the other team members.
- (e) Taiwan data - for linkage

APPENDIX I: LIST OF PRESENTERS

- **Prof. Martin W Bauer**, Principal Investigator, EU-India Research Network, Institute of Social Psychology & Methodology Institute, London School of Economics, United Kingdom.
- **Prof. Rajesh Shukla**, Indian Principal Investigator, EU-India Research Network, Visiting Professor, Institute for Human Development (IHD), New Delhi.
- **Dr. Petra Pansegrau**, Faculty of Linguistics and Literary Studies, Institute of Science and Technology Studies (IWT), University of Bielefeld, Germany.
- **Dr. Yuh-Yuh Li**, Researcher, Centre for Public Literacy Promotion, National Sun Yat-Sen University, Taiwan.
- **Dr. Nick Allum**, Senior Lecturer, Department of Sociology, University of Essex, United Kingdom.
- **Dr. Ahmet Suerdem**, Senior Lecturer, Business Administration, Istanbul Bilgi University, Turkey.
- **Ms. Preeti Kakkar**, Senior Research Fellow, NCAER-Centre for Macro Consumer Research (NCAER-CMCR), New Delhi.
- **Dr. Subhasis Sahoo**, Guest Faculty, Department of Sociology, Delhi School of Economics, University of Delhi.

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APPENDIX III: PROGRAMME SCHEDULE

PROJECT INCEPTION MEETING

MAPPING THE CULTURAL AUTHORITY OF SCIENCE ACROSS EUROPE AND INDIA (MACAS-EU & INDIA)

Date: 22-24 November, 2012

Venue: Conference Hall

INDIA–EUROPEAN RESEARCH NETWORKING PROGRAMME: 2012-14

Indian Council of Social Science Research (ICSSR)
New Delhi, India

AGENDA

DAY ONE - 22 NOVEMBER, 2012

INAUGURAL SESSION

9:30– 10:00: Registration

10.00-11.00: Aims and Scope of MACAS Project

Prof. Martin W Bauer, Indian Principal Investigator, EU-India Research Network, London School of Economics, United Kingdom

Prof. Rajesh Shukla, Visiting Professor, Institute for Human Development (IHD), New Delhi

11:00-11.30: *Tea/Coffee Break*

SESSION I: OVERVIEW

Chair: Martin W. Bauer

11:30 to 12:30: Constructing Science Culture Indicators:

EU-India Comparative Framework, **Rajesh Shukla** (IHD)

Data Integration: Learning from Gesis Data Catalogue, **Preeti Kakkar** (NCAER-CMCR)

Mobilisation for Science in India, **Subhasis Sahoo** (University of Delhi)

12:30-13.00: Discussion

13:30-14:30: *Lunch*

SESSION II: WORK AND IDEAS FOR DEVELOPMENT

Chair: Petra Pansegrau

14:30-16:30:

Para-scientific beliefs and literacy in Taiwan, **Yuh-Yuh Li** (Tsian-kai-shek University, Taiwan)

Imputation of missing data in Euro Barometer, **Nick Allum** (Essex University, UK)

Tea/Coffee Break

Wrap up for the day and action plan for day 2

19:00: *Dinner*

DAY TWO – 23 NOVEMBER, 2012

SESSION I: WORK AND IDEAS FOR DEVELOPMENT

Chair: Nick Allum

11:00 – 12:30: Discourse analysis of Global Warming in Germany

Petra Pansegrau (IWT, University of Bielefeld)

Tea/Coffee Break

Text-mining for Science Indicators

Ahmet Suerdem (Istanbul Bilgi University, Turkey)

12:30-13.00: Discussion

13:00-14:00: *Lunch*

SESSION II: WORK AND IDEAS FOR DEVELOPMENT

Chair: Martin W Bauer

14:00-14:30: Talk by **Gauhar Raza**, NISCAIR, New Delhi

14:30-16:15: Open brain storming, additional data to be considered in each context, secondary data and other new data to be collected in each context, bringing new ideas into the scope of the project

Module 1: *Science Culture Index*

Module 2: *Comparative-Longitudinal Analysis of Science News*

Module 3: *Comparative Case Studies of Rural-Urban Science Culture*

Tea/Coffee will be served between the modules.

16:15-16:30: *Wrap up for the day and action plan for day 3*

19:00: *Gala Dinner Party (Organized by IHD)*

Venue: IIC (India International Centre)

DAY THREE – 24 NOVEMBER, 2012

SESSION I: WORK PLANS – EU, INDIA

Chair: Martin W Bauer / Petra Pansegrau / Rajesh Shukla

10:30 – 13:00: Open brain storming, additional data to be considered in each context, secondary data and other new data to be collected in each context, bringing new ideas into the scope of the project

Module 1: *Science Culture Index*

Module 2: *Comparative-Longitudinal Analysis of Science News*

Module 3: *Comparative Case Studies of Rural-Urban Science Culture*

Tea/Coffee will be served between the modules.

13:00-14:00: *Lunch*

14:00-19:00: Sightseeing (**Delhi Darshan**)

19:00: *Dinner*