

Concept Note – Four Workshop Series Institutionalized Skilling Ecosystem for Enhanced Realization of the SAGAR Vision – A New Perspective based on the UDA framework – 06 Mar 2023

Background

India stands at the brink of a remarkable transformation today, with both global and domestic cues are highly favourable and we as a nation seem to be in a sweet spot. The country appears to be perfectly poised to embark on a new phase of growth, owing to favourable political, economic, demographic, socio-cultural, and other circumstances. Over the past 75 years since independence, India has laid a solid foundation, and now is the time to take bold strides into the future. There has been a significant shift towards the maritime domain in the areas of strategic security and sustainable growth, and the government is placing a high priority on the blue economy and maritime security. The Honourable Prime Minister's vision of "The Security And Growth for All in the Region (SAGAR)" envisages India as a leader in the entire Indian Ocean region (IOR) and beyond. To realize this vision, it will be crucial to invest in building the necessary capacity and capabilities building at multiple levels.

The tropical littoral waters of the Indian Ocean region (IOR) present a unique set of challenges and opportunities that demand a tailored, local indigenous driven approach. Previous attempts at importing technology and knowledge from the West have fallen miserably. It is noteworthy that there is a significant potential for resources and opportunities in both marine and freshwater underwater ecosystems waiting to be utilized, but these areas require specialized expertise and cannot be viewed as a mere extension of the maritime surface. Science and technology (S&T) will play a crucial role in driving new initiatives, and it is imperative to cultivate indigenous, site-specific Research and development Development (R&D) efforts focused on addressing real-world problems through field experimentation and validation.

The Underwater Domain Awareness (UDA) framework has received widespread recognition for promoting safe, secure, and sustainable growth in the tropical littoral waters of the Indo-Pacific region. The Digital Ocean construct supported by the UDA framework, will significantly enhance good maritime governance. It encourages pooling of resources and synergizing of efforts across the stakeholders and has devised technology tools to support livelihood for the coastal communities. The **Indo-Swiss Center of Excellence** has partnered with the **MRC** to establish a skills training initiative to further encourage the UDA framework across various line sectors.

This decade has been declared as the "Decade of Ocean Sciences for Sustainable Development" by the United Nations. It is crucial for local communities to be actively involved in the development process in order to achieve the Sustainable Development Goals in a true sense. This initiative is supported by the **HT Parekh Foundation** to build an institutionalized model.

Proposal

It is proposed to launch a quartet series of outreach and engagement programs for sensitization and institutionalization of robust skilling ecosystem to drive the UDA framework. The objective of this effort will be to construct a holistic livelihood enhancement ecosystem, fostering a well-structured environment that will empower communities to harness the water ecosystem sustainably and create sustainable livelihood prospects. The workshops, each of the three, five day sessions, will concentrate on one particular aspect of the ecosystem building initiative, culminating with a two-day workshop to synthesize the entire endeavour.

(a) ***Policy Intervention:*** This will be hosted to build on the entire spectrum of policy formulation. Both regional and national aspects will be deliberated and a roadmap for the future will be devised. A clear emphasis on skilling for livelihood enhancement will be emphasized. Participants from diverse backgrounds viz. humanities and liberal arts will gather to deliberate on the larger social engineering aspects and community level interventions from an institutionalization stand point. Key decision makers will also be present to identify gaps for policy interventions. The five-day workshop will be divided into the following facets:

- (i) The geopolitics and the geostrategic perspective.
- (ii) The traditional knowledge and opportunities for scaling
- (iii) The governance mechanisms and required intervention
- (iv) The capacity & capability building.
- (v) The structured institutionalized framework.

(b) ***Technology Intervention*** This will be hosted, with a focus on exploring the role of science and technology as a catalyst for livelihood enhancement. The emphasis will be to build sustainable development interventions to augment traditional knowledge, rather than replacing the traditional practices with modern tools. The key objective will be to leverage technology tools to improve governance and increase efficiency. The five-day workshop will be divided into the following aspects:

- (i) The Digital Ocean Framework.
- (ii) The Sustainable Development Goals.
- (iii) The Data Science Framework.
- (iv) The infrastructure gaps.
- (v) The multi-disciplinary and multi-functional structure.

(c) ***Grassroots Community Engagement*** This initiative will be hosted at the Konkan coast and involve collaboration with multiple partners from both the government and private sectors to engage with the coastal communities. Representatives from various grassroots communities, such as aquaculture, pisciculture, diving, shipbuilding and more, will convene in their respective community establishments for hands-on exposure. The two-day classroom interaction will encompass aspects of policy and technology interventions along with acoustic capacity, and capacity and capability building. Feedback from participants will be

solicited during this phase. The three-day field visit will encompass the following sectors:

- (i) Aquaculture.
- (ii) Pisci-culture.
- (iii) Underwater diving.

The last day will consist of a debrief and a feedback session for the entire four-day workshop, including interaction with authentic community representatives.

To culminate the series of three five-day workshops, a **two-day workshop** will be conducted at the Indo-Swiss Center of Excellence to articulate the key outcomes and build a structured institutional framework. Approximately fifty representatives from the entire ecosystem will be in attendance to facilitate the next steps.

Deliverables

The UDA framework is relevant to a multitude of stakeholders, but often lacks cohesive collaboration across governance mechanisms. To overcome this issue, pooling of resources and harmonization of efforts across stakeholders and policy makers will be crucial. The entire ecosystem needs to be managed in a comprehensive manner. The livelihood enhancement initiative must be managed holistically, not just through skilling, but through management of the entire ecosystem at various levels. This proposal aims to address all levels and stakeholders in a comprehensive manner as follows:

- a) The **policy interventions** will bring together a diverse group of decision makers from various ministries, regulators, policy advocacy groups, environmentalists, disaster management authorities and more. By providing **actionable inputs**, the ecosystem will mature and thrive. Sensitization of governance mechanisms is critical and will add value to the overall policy making process.
- b) The **science and technology** will always drive growth and governance, but local solutions for the ecosystem are challenging. **Digital transformation** will play a significant role in governance mechanisms to bring value to skilling initiatives in multiple ways. Improving infrastructure, building capacity and capabilities, conducting Research and Development (R&D), and more will require a nuanced approach, and can also generate significant **livelihood opportunities**.
- c) To ensure the validity of the framework, it must be tested and refined through **engagement with the communities** on the ground. This requires a cyclical iterative process of communication and collaboration between the planners and all relevant parties, in order to finalize a comprehensive plan that addresses the needs and concerns of the communities. Concerns of the communities and **assurance to the communities** that the governance mechanism cares, is extremely critical.

- d) The effective **ecosystem management** will require a multi-disciplinary and multi-functional framework. **Institutional** approach will require a massive pool of skilled and knowledgeable human resource to manage the ecosystem at multiple levels. This initiative will kick start this process. This initiative will serve as a catalyst for this process and provide a foundation for a nuanced structure.
- e) Women will be ambassadors in promoting and advancing this initiative in the future. Through **interaction with the communities** and a two-way feedback will provide a significant role in strengthening the initiative and driving its success. By positioning women as leaders and drivers of the ecosystem, **true women empowerment** will be achieved.

Take Away

At the conclusion of the program, each participant will receive a certificate of successful completion. As part of the program requirements, every participant must submit a comprehensive evaluation of their experience. The five most noteworthy write-ups will be recognized and rewarded at the grand closing ceremony. Student participants will have the opportunity to earn a fellowship at MRC based on their performance during the program.

Detailed Program

The series of four workshops will be planned as follows:

Workshop-1 The policy intervention will require deliberations from a spectrum of domain experts, strategic thinkers, industry bodies and others. The following program has been formalized:

Day-1 (06 Mar 2023)

0930 hrs	-	Inaugural Session
	0930 hrs	Welcome Address by Mr. Mukesh Malhotra
	0940 hrs	Opening Address by Prof Mukul S Sutaone,
	1000 hrs	Introductory Remarks by Dr(Cdr) Arnab Das
	1030 hrs	Key Note Address by Shri Pradeep Rawat
	1050 hrs	Remarks Shri Pradip Bhargava
	1110 hrs	Concluding Remarks by Amb Anup Mudgal
	1130 hrs	Vote of Thanks
1130 hrs	-	High Tea
1200 hrs	-	Detailed Presentation on the UDA Framework
		Dr (Cdr) Arnab Das
1330 hrs	-	Lunch Break
1430 hrs	-	Detailed Presentation on Socio-Political Framework
		Prof Anamika Barua, IIT Guwahati
1600 hrs	-	Tea Break
1630 hrs	-	Interactions & Conclusion
1730 hrs	-	Day End

Day-2 (07 Mar 2023)

- 0930 hrs - **Skilling Ecosystem and Challenges**
0930 hrs Panel Discussion
Amb Anup Mudgal, FICCI Task Force - Chair
Shri Ved Mani Tiwari, CEO NSDC
Dr. Apoorva Palkar, Vice Chancellor Skill University
Prof Anamika Barua, IIT Guwahati
Shri Praful Talera, GC Member – SSC Strat Manuf
- 1100 hrs - **High Tea**
- 1130 hrs - **Plenary Session – Blue Economic Perspective**
Amb Anup Mudgal, FICCI Task Force
Chaired by Shri Ashwin Shroff, Excel Industries
- 1300 hrs - **Lunch Break**
- 1400 hrs - **CRZ Management and the Challenges**
Dr. Deepak Samuel V, NCSCM Chennai
Chaired by Shri Ashwin Shroff, Excel Industries
- 1500 hrs - **Tea Break**
- 1530 hrs - **Seaweed Cultivation in India**
Ms. Devleena Bhattacharjee, Climacrew Team
- 1630 hrs - **Project Presentation by MRC Fellows**
Mr. Shlok Nevani – Shrimp & Seaweed Cultivation
Ms. Shelja Alawadi – Sustainable Development Goals
- 1730 hrs - **Day End**

Day-3 (08 Mar 2023)

- 0930 hrs - **Maritime History & Traditional Knowledge**
Dr. Radhika Seshan, Maritime Historian
- 1100 hrs - **Tea Break**
- 1130 hrs - **Marine Spatial Planning from a Global Perspective**
Dr. Vladimir Ryabinin, Exec Secretary of IOC UNESCO
- 1230 hrs - **MRC Project Presentation on Marine Spatial Planning**
Mr. Sanskar Soni, IIT Delhi
- 1300 hrs - **Lunch Break**
- 1400 hrs - **Choke Points and the Global Order - Shri Praful Talera**
- 1530 hrs - **Tea Break**
- 1600 hrs - **Project presentation by MRC Fellow**
Ms. Nishtha Vishwakarma – UDA Digest
- 1700 hrs - **Day End**

Day-4 (09 Mar 2023)

- 0930 hrs - **Interaction and Conclusions**
- 1000 hrs - **MRC Project Fellow Presentation**
Sediment Transport – Ms. Rishika Khanna
- 1100 hrs - **Tea Break**
- 1130 hrs - **Brahmaputra and the Inland Water Transport**
Capt Sudhir Subedar, Former DDG Shipping

1300 hrs	-	Lunch Break
1400 hrs	-	Detailed Presentation Marine Biosphere Reserves Dr. Neha Midha, Head Natural Sciences, UNESCO India
1500 hrs	-	The SAGAR Vision and the New Global Order His Excellency Shri Jawed Ashraf, Ambassador of India to France
1600 hrs	-	Tea Break
1630 hrs	-	Interactions & Conclusions
1730 hrs	-	Day End

Day-5 (10 Mar 2023)

0930 hrs	-	Water Resource Management and Rural Livelihood Prof Ajay Dandekar, President BRLF
1100 hrs	-	High Tea
1130 hrs	-	Climate Change and the UDA Framework Dr. Swayamprabha Das
1300 hrs	-	Lunch Break
1400 hrs	-	Plenary Session – India’s Capacity Building Plan Shri Hemang Jani, Secretary Capacity Building Commission (CBC), Government of India & Shri Himansu Pandey, CBC Government
1500 hrs	-	Remarks by Dignitaries Capt Sudhir Subedar, Former DDG Shipping Vice Admiral DSP Varma (Retd), Former DG ATVP Shri Pratap Rao Pawar, Chairman BOG COEP Shri Hemang Jani, Secretary CBC Gol.
1530 hrs	-	Tea Break
1600 hrs	-	Interaction & Conclusion
1700 hrs	-	Workshop Ends

Workshop-2 The technology intervention will require deliberations from a spectrum of domain experts, strategic thinkers, industry bodies and others. The following program has been formalized:

Day-1 (13 Mar 2023)

0930 hrs	-	Inaugural Session
0930 hrs		Welcome Address by Vice Adm DSP Varma (Retd)
0940 hrs		Opening Address by Prof Mukul Sutawane, VC
1000 hrs		Introductory Remarks by Dr(Cdr) Arnab Das
1030 hrs		Key Note Address Dr. Satheesh Shenoy
1050 hrs		Special Remarks by Ms. Lakshmi Krishnakumar
1105 hrs		Concluding Remarks by Shri Kishore Mandya,
1120 hrs		Vote of Thanks by Shri Praful Talera
1130 hrs	-	High Tea
1200 hrs	-	Presentation on High Performance Computing Dr, Ashish Kuvelkar, CDAC Pune

- 1330 hrs - Lunch Break
- 1430 hrs - Quantum Computing and the New Horizon
Dr. L Venkata Subramaniam, IBM India
- 1600 hrs - Tea Break
- 1630 hrs - MRC Project Presentation on Marine Spatial Planning
Mr. Sanskar Soni, IIT Delhi
- 1630 hrs - MRC Project Presentation on Sediment Transport
Ms. Rishika Khanna, IIT Delhi
- 1730 hrs - Day End

Day-2 (14 Mar 2023)

- 0930 hrs - Innovation and Start-up Ecosystem
- 0930 hrs - Panel Discussion
Vice Admiral DSP Varma (Retd) – Chair
Dr. R Vijay Kumar, IIT Chennai
Cmde Uday Talwelkar (Retd), VP Bharat Forge
Shri Neeraj Panchal, John Deere
Shri Mandar Joshi, CEO Bhau Institute
- 1100 hrs - Tea Break
- 1130 hrs - Presentation on Underwater Robotics
Dr. R Vijay Kumar, IIT Chennai
- 1300 hrs - Lunch Break
- 1400 hrs - Innovation and the Protection of Copy Right
Shri Neeraj Panchal, John Deere
- 1530 hrs - Tea Break
- 1600 hrs - MRC Project Presentation on Sediment Classification
Mr. Romit Kaware, IIT Delhi
- 1600 hrs - MRC Project Presentation on Indus River Basin
Ms. Catherine J
- 1730 hrs - Day End

Day-3 (15 Mar 2023)

- 0930 hrs - Metaverse and the Possibilities
Mr. Manas Dewan, Brand Kiln
- 1100 hrs - Tea Break
- 1130 hrs - Freshwater Ecosystem and the Challenges
Shri Avinash Mishra, Senior Advisor NITI Aayog
- 1300 hrs - Lunch Break
- 1400 hrs - Detailed Presentation National Security Challenges
Lt Gen V G Khandare (Retd), Adviser Min of Defence
- 1530 hrs - Tea Break
- 1600 hrs - Indian Coast Guard Roles & Responsibilities
Commandant (JG) R Ravi Shankar
- 1630 hrs - MRC Project Presentation on APY Analysis
Mr. Shlok Namani, IIT Mumbai
- 1730 hrs - Day End

Day-4 (16 Mar 2023)

- 0930 hrs - Indo-Pacific and the IOR – Challenges & Opportunities
Dr. David Brewster, SRF Australian National University
- 1100 hrs - Tea Break
- 1130 hrs - Detailed Presentation Non-traditional Security threats
Cmde Somen Banerjee, Strategic Security Expert
- 1300 hrs - Lunch Break
- 1400 hrs - The India-EU Strategic Maritime Collaboration
His Excellency Shri Raj Kumar Srivastava,
India's Ambassador to Croatia
- 1530 hrs - Tea Break
- 1600 hrs - Presentation on AI & Data Analytics - UDA Framework
Mr. Shridhar Prabhuraman, MRC Deputy Director
- 1730 hrs - Day End

Day-5 (17 Mar 2023)

- 0930 hrs - Special Session on Maritime Governance
- 0930 hrs Welcome Address by Lt Gen D B Shekatkar(Rtd)
Chairman Shekatkar Committee
- 0940 hrs Opening Address by Shri Vikram S Puri
Group President & CEO, POSHS Group
- 1000 hrs Introductory Remarks by Dr(Cdr) Arnab Das
- 1030 hrs Key Note Address by Shri Krishna Prakash, IPS
Spl IGP Coastal Police, Maharashtra
- 1050 hrs Chief Guest Remarks by Vice Admiral Ajay
Kochar, Commandant National Defence
Academy
- 1110 hrs Concluding Remarks by Shri Jayant Patil,
Board Member L&T Defence
- 1120 hrs Vote of Thanks by Shri Praful Talera
- 1130 hrs - High Tea
- 1200 hrs - Maritime History - Security Perspective in the IOR
Prof Radhika Seshan, Maritime Historian
- 1330 hrs - Lunch Break
- 1430 hrs - Strategic Security Challenges & Opportunities
- 1430 hrs Panel Discussion
Shri Jayant Umranikar, IPS - Chair
Addl DG (CG) Vijay D Chafekar (Retd),
Shri Krishna Prakash, Spl IGP Coastal Police
Rear Adm Amit Vikram (Retd), DY Patil Group
L&T Representative
- 1600 hrs - Tea Break
- 1630 hrs - Interactions and Conclusions
- 1730 hrs - Workshop End

Workshop-3 The community interaction will require a spectrum of entities, communities, innovative tools, mechanism of interactions and more. The following program has been formalized:

Day-1 (20 Mar 2023)

- 0800 hrs - Proceed to Malwan by Bus
- 1630 hrs - Arrive Malwan
- 1700 hrs - Tea & Settle down in Accommodation
- 1930 hrs - Briefing for the Field Visits
- 2030 hrs - Dinner & Day End

Day-2 (21 Mar 2023)

- 0900 hrs - Arrive at IISDA Tarkarli
- 0930 hrs - Tea Break
- 1000 hrs - Catamaran ride 20 PAX/ SCUBA Diving demonstration 20 PAX
- 1230 hrs - Lunch Break
- 1400 hrs - Catamaran ride 20 PAX/ SCUBA Diving demonstration 20 PAX
- 1700 hrs - Tea break/ Debrief and End of Day Activity

Day-3 (22 Mar 2023)

- 0730 hrs - Leave for Taramumbari-Devgad
- 0830 hrs - Arrive at Mangrove Ecotourism site
- 0900 hrs - Mangrove boat ride 10 PAX/Kayaking 4 PAX/ Briefing on the ecotourism strategy by Mangrove Foundation staff
- 1230 hrs - Lunch Break
- 1430 hrs - Leave for Hadi (Aquaculture site and Biodiversity interpretation centre)
- 1430 hrs - Briefing on cage culture project by Mangrove Foundation Staff
- 1630 hrs - Leave for resort
- 1730 hrs - Tea Break & De-brief and end of day activity

Day-4 (23 mar 2023)

- 0900 hrs - Arrive at IISDA conference room
- 0930 hrs - Address by MRC Director
- 1000 hrs - Presentations by Marine Researchers working in the Region
- 1230 hrs - Lunch break
- 1330 hrs - Presentations by Marine Researchers continue
- 1600 hrs - Interactions and Conclusions
- 1800 hrs - Tea Break & De-brief and end of day activity

Day-5 (24 Mar 2023)

- 0700 hrs - Breakfast & Departure to Pune
- 1800 hrs - Arrive Pune and Close of Workshop

Underwater Domain Awareness (UDA) Framework

The concept of Underwater Domain Awareness (UDA) in a more specific sense will translate to our eagerness to know what is happening in the undersea realm of our maritime areas. This keenness for undersea awareness from the security perspective, means defending our Sea Lines of Communication (SLOC), coastal waters and varied maritime assets against the proliferation of submarines and mine capabilities intended to limit the access to the seas and littoral waters. However, just the military requirement may not be the only motivation to generate undersea domain awareness. The earth's undersea geophysical activities have a lot of relevance to the wellbeing of the human kind and monitoring of such activities could provide vital clues to minimize the impact of devastating natural calamities. The commercial activities in the undersea realm need precise inputs on the availability of resources to be able to effectively and efficiently explore and exploit them for economic gains. The regulators on the other hand need to know the pattern of exploitation to manage a sustainable plan. With so much of activities, commercial and military, there is significant impact on the environment. Any conservation initiative needs to precisely estimate the habitat degradation and species vulnerability caused by these activities and assess the ecosystem status. The scientific and the research community need to engage and continuously update our knowledge and access of the multiple aspects of the undersea domain. Fig. 1, presents a comprehensive perspective of the UDA. The underlying requirement for all the stakeholders is to know the developments in the undersea domain, make sense out of these developments and then respond effectively and efficiently to them before they take shape of an event.

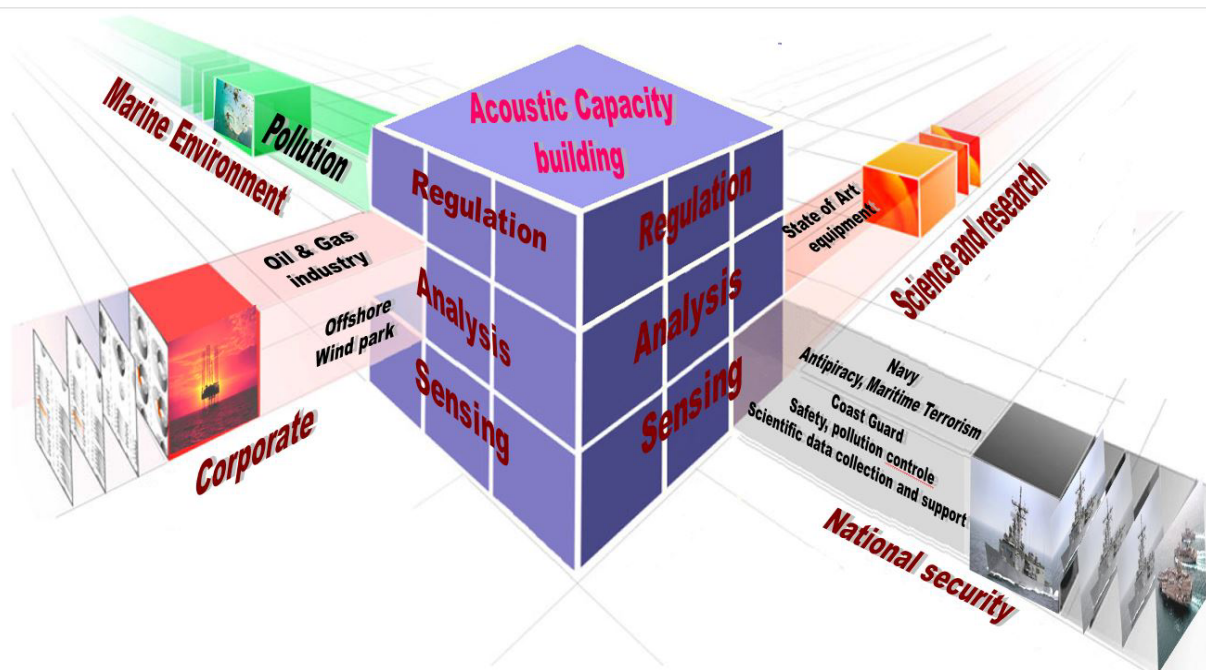


Fig. 1 Comprehensive Perspective of Undersea Domain Awareness

The UDA on a comprehensive scale needs to be understood in its horizontal and vertical construct. The horizontal construct would be the resource availability in terms of technology, infrastructure, capability and capacity specific to the stakeholders or otherwise. The stakeholders represented by the four faces of the cube will have their specific requirements, however the core will remain the acoustic capacity and capability. The vertical construct is the hierarchy of establishing a comprehensive UDA. The first level or the ground level would be the sensing of the undersea domain for threats, resources and activities. The second level would be making sense of the data generated to plan security strategies, conservation plans and resource utilization plans. The next level would be to formulate and monitor regulatory framework at the local, national and global level.

The figure above gives a comprehensive way forward for the stakeholders to engage and interact. The individual cubes represent specific aspects that need to be addressed. The User-Academia-Industry partnership can be seamlessly formulated based on the user requirement, academic inputs and the industry interface represented by the specific cube. It will enable more focused approach and well defined interactive framework. Given the appropriate impetus, the UDA framework can address multiple challenges being faced by the nation today. Meaningful engagement of Young India for Nation Building, probably is the most critical aspect that deserves attention. Multi-disciplinary and multi-functional entities can interact and contribute to seamlessly synergize their efforts towards a larger goal.

The UDA Framework as proposed above has been formulated jointly by the Maritime Research Centre (MRC), Pune and M/S NirDhwani Technology Pvt Ltd (NDT). The focus is on all the three aspects namely Policy, Technology & Innovation and Human Resource Development. More details are available in the MRC website <https://mrc.foundationforuda.in>.