

Technology Requirements Brief (TRB) For Soil Stabilization Technology

Purpose: This brief facilitates the scanning of global markets for innovative technologies that address core development challenges. It does not constitute the start of a bidding process but rather outlines specific technical requirements with the aim of building a pool of scalable solutions in Soil Stabilization technology that meets the technological demands of IsDB Member Countries. These technologies are intended to be integrated into IsDB financed projects to improve project efficiency and overall impact. IsDB may contact suitable respondents to learn more about technology as part of its due diligence before recommending for its deployment.

1. Development Challenge

More than 60% of the rural population in IsDB's LDMCs lack access to reliable, all-season roads, living more than 2 km or more away from such roads. Therefore, expanded access to rural roads is a priority for most countries. However, there are several challenges such as cost, location and scarcity of materials that impede the scaling up of current rural roads strategies and initiatives. Most traditional methods are not easily scalable as they may be too expensive per kilometer, too maintenance-intensive, and not sufficiently climate-resilient due to heavy material imports, lack of local capacities, requiring heavy engineering for maintenance, and increased carbon footprint.

2. Desired Development Outcomes

To improve road access and favorably impact on the associated development outcomes, it is important to scale up rural road networks by exploring innovative, affordable, environmentally friendly and cost-effective rural road technologies in order to boost infrastructure for development. This has implications for adoption of technologies such as innovative soil stabilization technologies, as a fit-for-purpose solution for rural roads, with a high potential for: i) reducing heavy imports and cost; ii) less use of heating and energy; iv) improving local capacities for construction and maintenance.

3. Existing conditions, Deployment Context & Readiness

As IsDB member countries increasingly prioritize inclusive rural accessibility, agricultural commercialization, and resilience to climate shocks, there is strong potential for more affordable and scalable engineering solutions to increase road access for vulnerable rural populations in rural areas. Mostly, existing earth or gravel surfaces that deteriorate rapidly under rainfall, incur high maintenance burdens, and rely on scarce imported aggregates and heavy equipment that make traditional road construction models financially and operationally unsustainable.

The systematic turnkey deployment of innovative soil stabilization technology must objectively demonstrate value for money in terms of cost and technical standards, accompanied by testing facilities, adherence to standards for innovative stabilizers and the development of capacities for quality control.

4. Required information and Technology Functional and Performance Requirements Technology Requirements

Generally, innovative soil stabilization technologies should address the challenges highlighted in this brief- providing a more cost-effective means of constructing roads in an environmentally friendly, easily deployable using turnkey modality (from design to operations). In addition to lowering construction costs, the technology should also cut maintenance expenses and/or extend road life. The solution should be mature and tested, market-ready with proven track record, and be easily adaptable within member country contexts.

i) Required information include the following:

- Evidence of performance – certifications, test results, case studies
- Financial parameters – indicative cost, operational model (CAPEX/OPEX), payback
- Business model and proposed approach for LDMC adaptation
- Track record of deployment to at least three customers with total sales revenue of at least US\$20 million.
- Existing deployments in developing countries (if applicable)

The technology appraisal form (**application link**) must be completed in addition to the above information requested.

ii) Specific Technical and Financial requirements:

The following are the specific technical and financial requirements to be met by the innovative soil stabilization technologies.

Technical Specifications and Attributes

- All weather conditions and High Durability
- Low maintenance cost
- Medium to low Construction Cost and transportation construction costs
- Predictable design life with High Road safety
- Medium Material and Equipment Requirements
- Medium Stone/Gravel Requirements
- Low Energy Requirements (No heating required)
- Medium Environmental and Social Impact (i.e. Low Carbon Footprint)
- Fast Construction Period
- Adaptable and transferable technology
- Minimum of 10 years maintenance warranty covering all maintenance works for roads and other related components.

Financial requirement

- **Asphalt Roads:** Cost per kilometer should be around at least 20% less compared to the cost of constructing similar asphalt roads using conventional methods in the same country and/or same region.
- **Earth Roads:** Cost per kilometer should be around at least 30% less compared to the cost of constructing similar earth roads using conventional methods in the same country and/or same region.
- **Maintenance Cost:** Cost per kilometer of maintenance should be significantly lower than the cost of maintaining asphalt/earth roads in the same country and/or same region.

- 5. Potential Risk and Safeguards

In terms of other requirements, it is important to note that turnkey deployment of the innovative soil stabilization technologies will be aligned with the following mitigation measures to avoid risks:

- **Non-Suitability and/or non-sustainability of technology:** Selected technologies will be subjected to independent evaluations, to determine validity of the claims, and

the implications for adapting the technologies. Only proven and tested technologies will be considered, noting that capacity development and technology transfer implications for technology adoption should be clearly outlined in the documents to be uploaded and application link.

- **Cost- effectiveness and competitiveness:** Comparative analysis of available technologies will be conducted to ensure that the cost of the proposed technology is reasonable and competitive.

6. Process and Next Steps

a) Submissions and Responses will be reviewed to:

- Map available technologies by readiness level
- Short list of candidates for the next steps: Due diligence and independent technology evaluations
- Be considered in line with the TDCP for potential partnership

b) Following the shortlisting, selected respondents may be contacted for the following as part of due diligence processes:

- Technical discussions and demonstrations
- Site-visit requests or virtual showcases
- Provision of additional documentation

7. Attachments to be uploaded in the final part of the application in the link given:

- i) Signed covering letter
- ii) Business/Entity Registration Document
- iii) Technology summary: Sector, purpose, operational model
- iv) Evidence of performance: Certifications, test results, case studies
- v) Deployment requirements
- vi) Financial parameters: indicative cost, operational model (CAPEX/OPEX), payback
- vii) Business model and proposed approach for adaptation to developing country needs
- viii) Track record requirements detailing existing deployments in developing countries