



Soil Hardening Agent STEIN As Decarbonization technology

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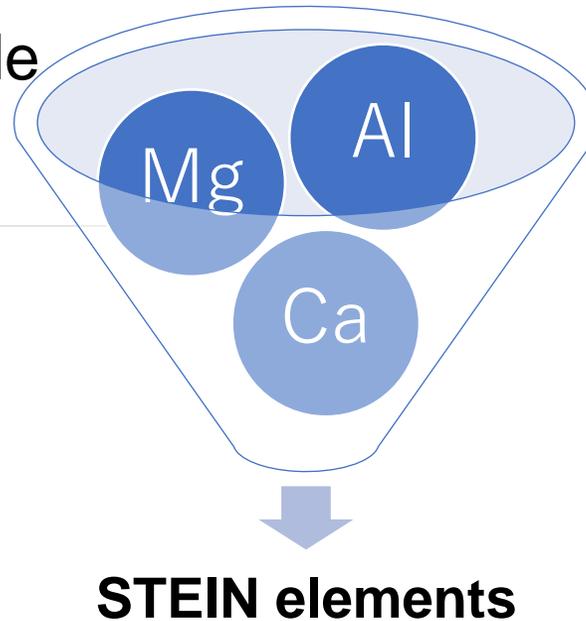
Portland
Cement
(95%)

Developed in 1975 in Japan and
more than 1,500 sites in Japan

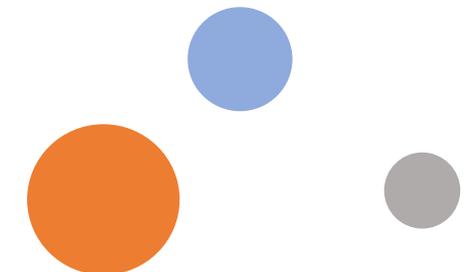
+
STEIN
Element
(5%)

Make soil hard enough and used
for the pavement of road

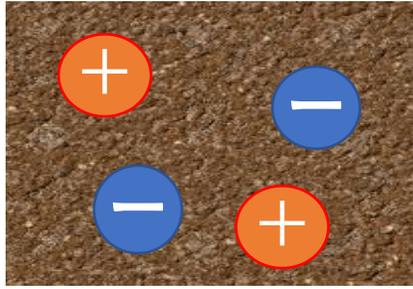
Enable low-cost and simple
construction steps



WHAT IS STEIN?



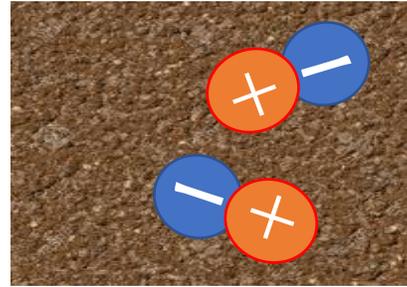
MECHANISM OF STEIN



Each particle in the soil charges positive or negative potential.



STEIN



STEIN accelerate bonding the electric potential of soil particles each other.



Add water and promote hydration reaction of cement to make bound stronger



Soil

STEIN

Cement

STEIN
elements

Reduce emission of GHG

- ◆ Reduce the material from outside by making use of soil
- ◆ Reduce emission from heavy machinery during construction
- ◆ Comparing to reinforced concrete, STEIN reduce 92% of GHG

CONSTRUCTION FLOW

Road



spreading



mixing



compaction



curing by water

Canal





Farm road constructed 1975



Bottom and slope of canal



Waterways for disaster prevention



Dust prevention of the ground



Weed prevention

CASES IN JAPAN

PROJECT ABROAD



Farm road
Ministries



STEIN plant



State road
State government



Access road in
refugee camp



Joint research with
University



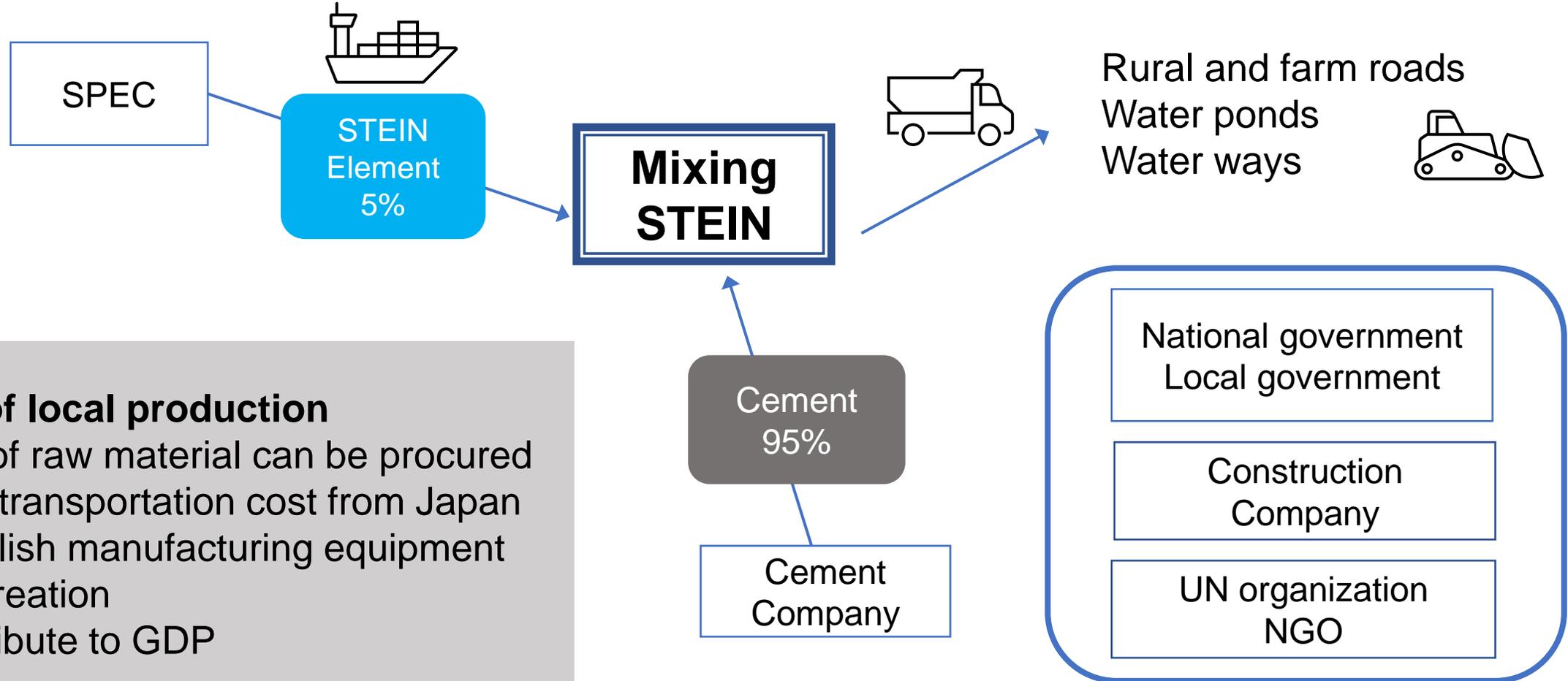
Waterways
Ministry of irrigations

FUTURE BUSINESS MODEL

COUNTRY A



JAPAN



Merits of local production

- ✓ 95% of raw material can be procured
- ✓ Save transportation cost from Japan
- ✓ Establish manufacturing equipment
- ✓ Job creation
- ✓ Contribute to GDP

SUMMARY

- A construction material that hardens soil and enables the construction of roads, waterways, and reservoirs.
- Sustained in good condition at least 10 years and up to 45 years.
- Cost can be reduced by 40-60% and emission of GHG for 92% compared to the reinforced concrete.
- In the future, SPEC will export the core elements of STEIN and accelerate the local production.

CONTACTS

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Stein

