



Micronutrient Fertilization Strategies in Bangladesh

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**SOILS:
WHERE FOOD
BEGINS**

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Importance of Micronutrient

Micronutrient deficiency is considered as one of the emerging challenges to food and nutrition security particularly in developing countries. There is a growing realization of food-based approach for addressing this issue.

Importance of Micronutrient

Micronutrients are indispensable for most living organisms, including human who need a supply of 16 mineral microelements, which can be obtained through a balanced diet. Recommended daily Zn consumption ranges from 8-11 mg.

Zn & B: Human health

- **Zinc deficiency is relatively frequent and well characterized and the absence of Zn negatively affects the immune system efficacy which is proven in the last Covid- 19 pandemic and the sensibility of taste and smell along with DNA synthesis.**
 - **Boron (B) is a limiting factor in crop productivity in rice-based systems. Such a deficiency of B has emerged as an important micronutrient problem in soils and crops in the subcontinent next to the Zn which is equally important for human and animal reproduction.**
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Micro Nutrients

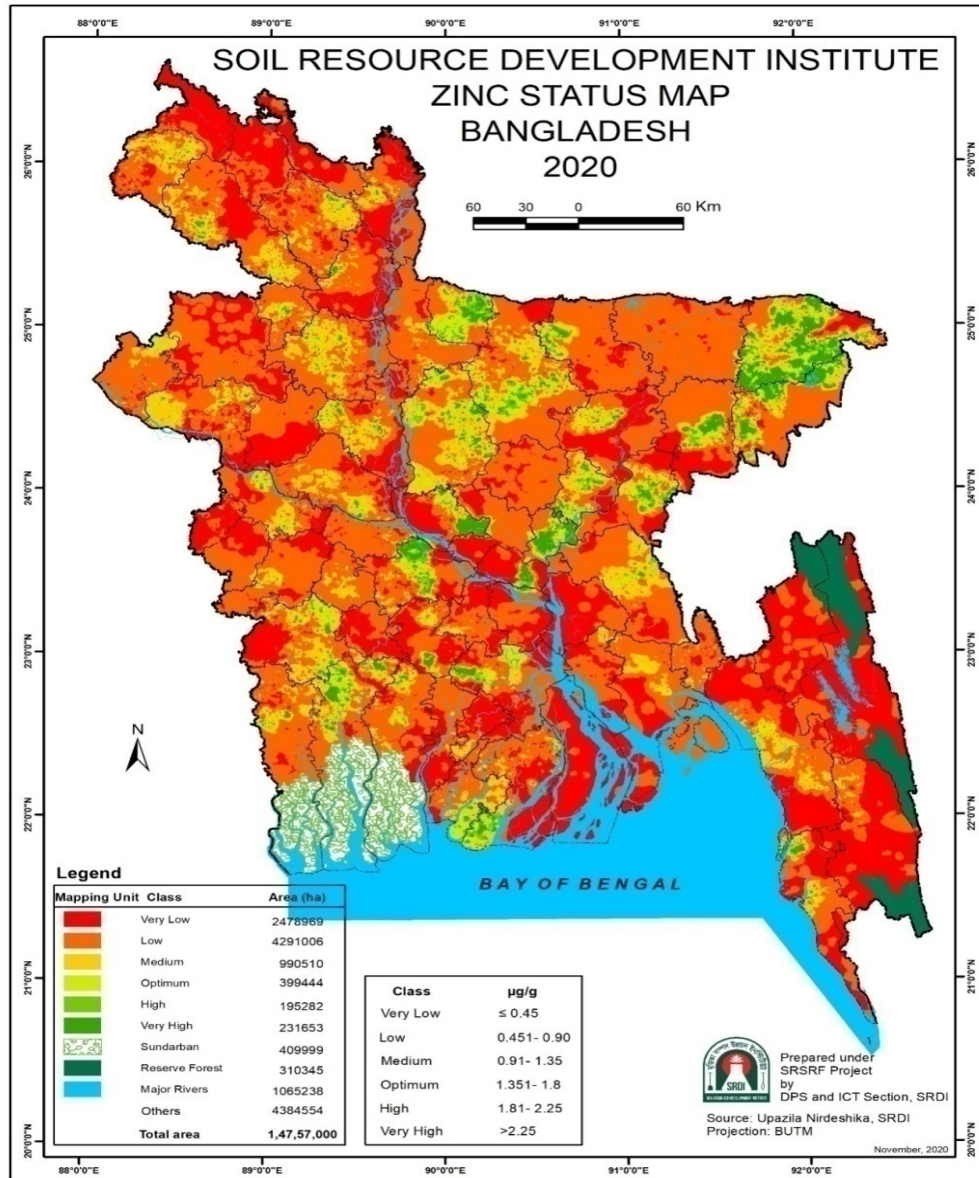
There requirement by plants is in trace amounts. Boron, iron, copper, zinc, manganese, magnesium and molybdenum constitute main micronutrients required by different crops in variable quantities.

Micronutrients are essentially as important as macronutrients to have better growth, yield and quality in plants.



Importance of balance fertilizer application

Imbalance application of fertilizer may harm our environment as well as the use efficiency of applied fertilizer may retard. More over, surface water specially river, channel, bill and pond water quality affected. Some times under ground water quality also be affected.



Soil zinc content and its changing trend in Bangladesh soils since 2010-2020.

Table1 Changing pattern of soil zinc status (area and percentage of arable lands) in loamy to clayey soils since 2010 to 2020 in Bangladesh

Fertility class	Year 2010		Year 2020	
	Area (ha)	Percent (%)	Area (ha)	Percent (%)
Very Low to Low	2755514	28.71	6769975	78.84
Medium	1822941	18.99	990510	11.54
Optimum	1407845	14.67	399444	4.65
High to Very High	3612081	37.63	426935	4.97
Total arable land	9598381	100.00	8586864	100.00

Changing pattern of zinc

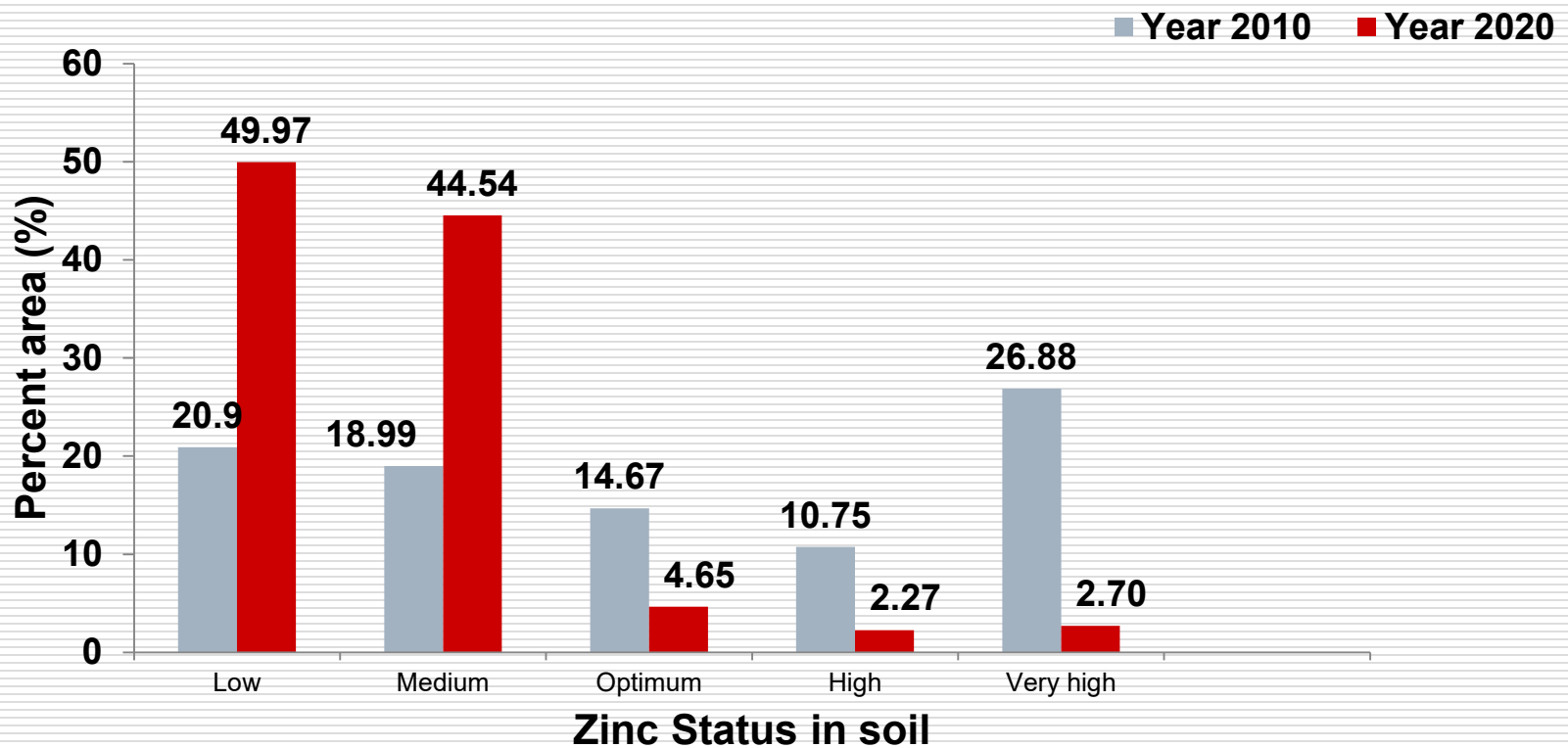


Fig.1 Changing pattern of soil zinc status (%) of arable lands) in loamy to clayey soils since 2010 to 2020 in Bangladesh.

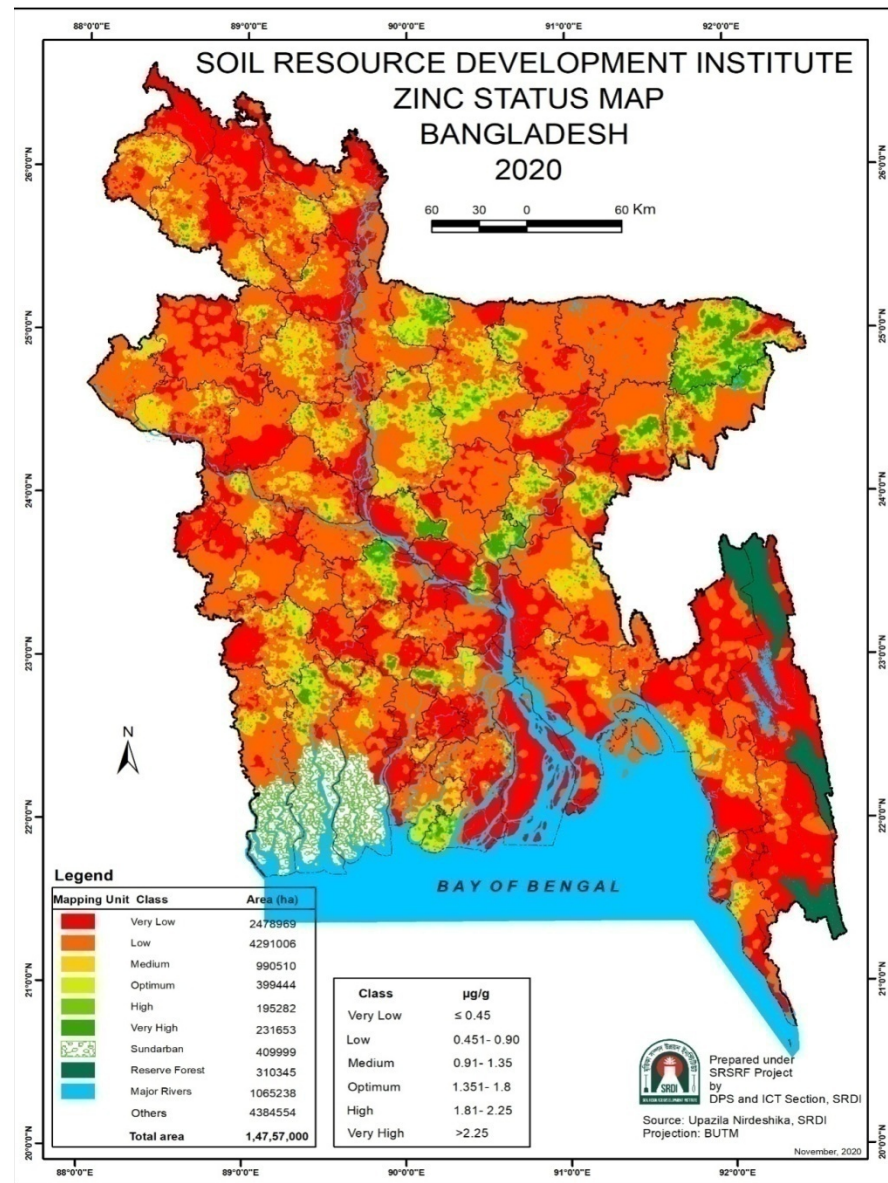
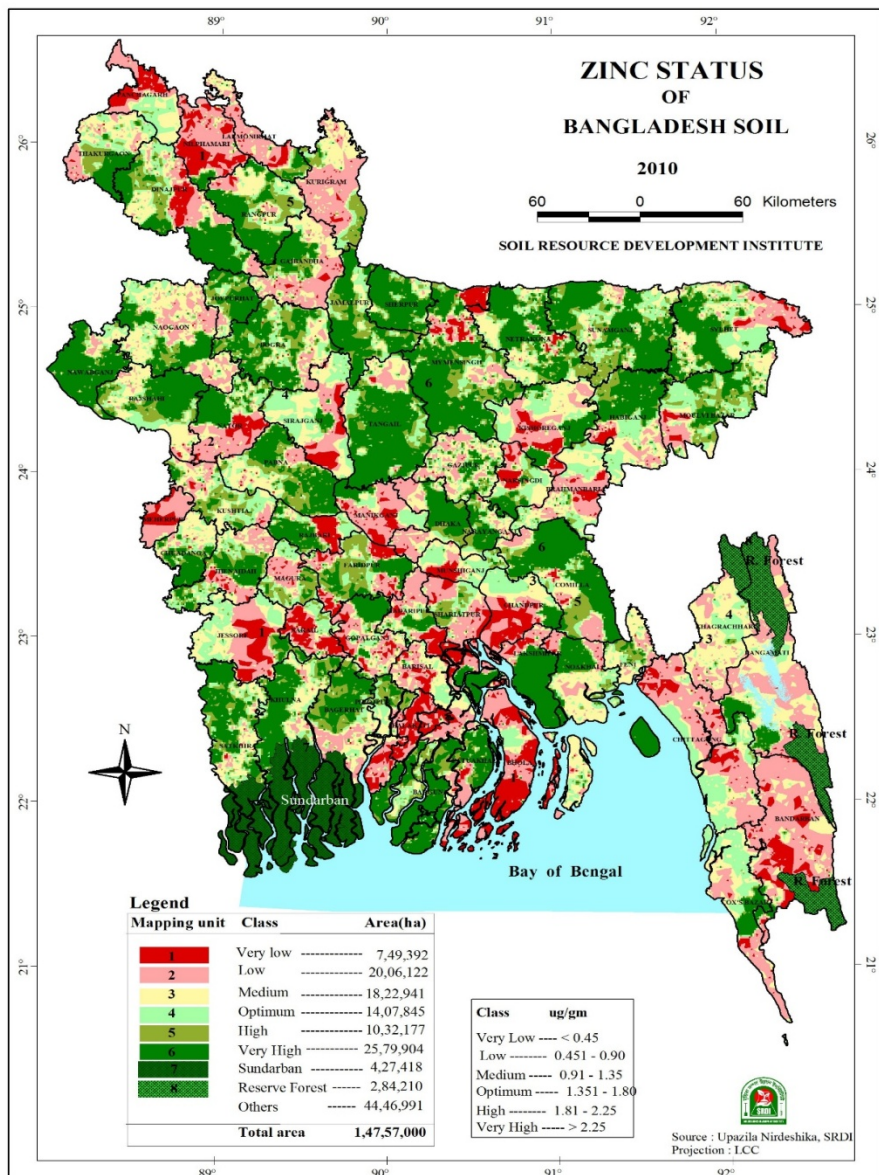
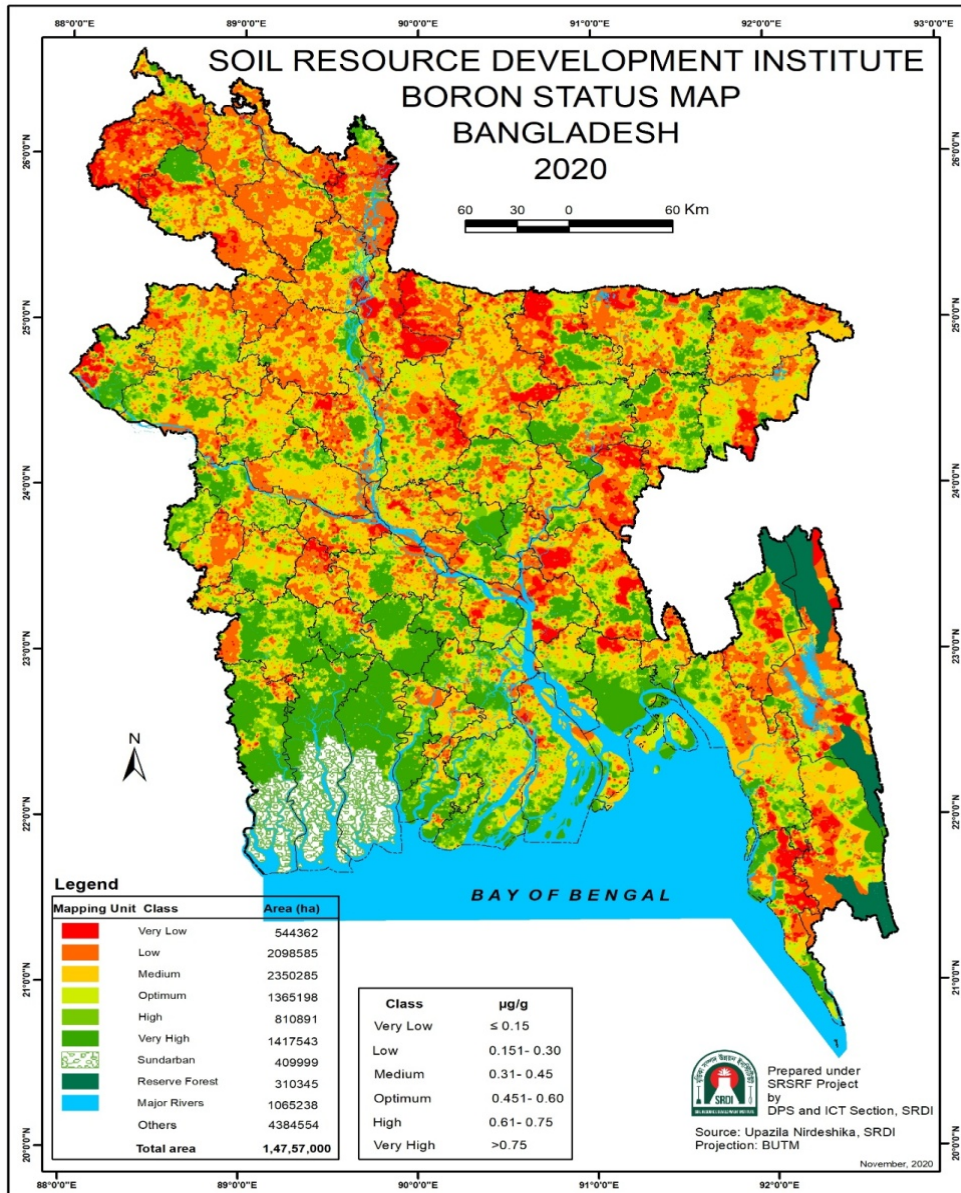


Fig.2 Zinc Status Map for Loamy to Clayey Soils, Year 2010 & 2020 in Bangladesh.

Table 2 Zinc Fertilizers in Bangladesh

Government specification for different Zinc fertilizers

Name of fertilizer	Zn – content (%)	SO ₄ - S content (%)	Water soluble Zn (%)
Zinc sulphate Monohydrate	36.0	17.5	95
Zinc sulphate Heptahydrate	21.0	10.5	95
Chelated Zinc	10.0	0	100



Soil boron content and its changing trend in Bangladesh soils since 2010-2020.

Table 3 Changing pattern of soil boron status in loamy to clayey soils since 2010 to 2020 in Bangladesh

Fertility class	Year 2010		Year 2020	
	Area (ha)	Percent (%)	Area (ha)	Percent (%)
Very Low to Low	2494193	25.99	2642947	30.78
Medium	2006311	20.9	2350285	27.37
Optimum	1542449	16.07	1365198	15.9
High toVery High	3555428	37.04	2228434	25.95
Total	9598381	100.00	8586864	100.00

Changing pattern of boron

■ Year 2010 ■ Year 2020

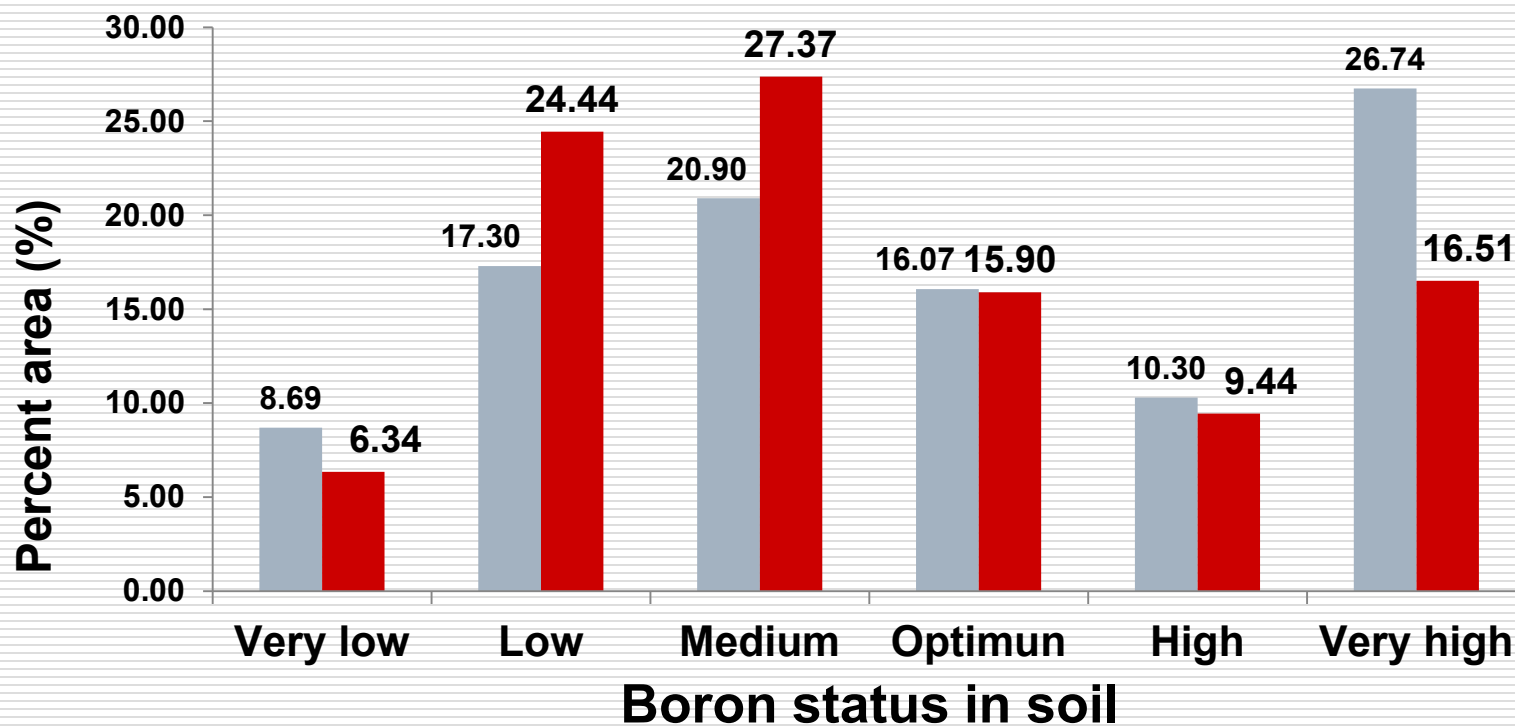


Fig.3 Changing pattern of soil boron status (%) of arable lands in loamy to clayey soils since 2010 to 2020 in Bangladesh.

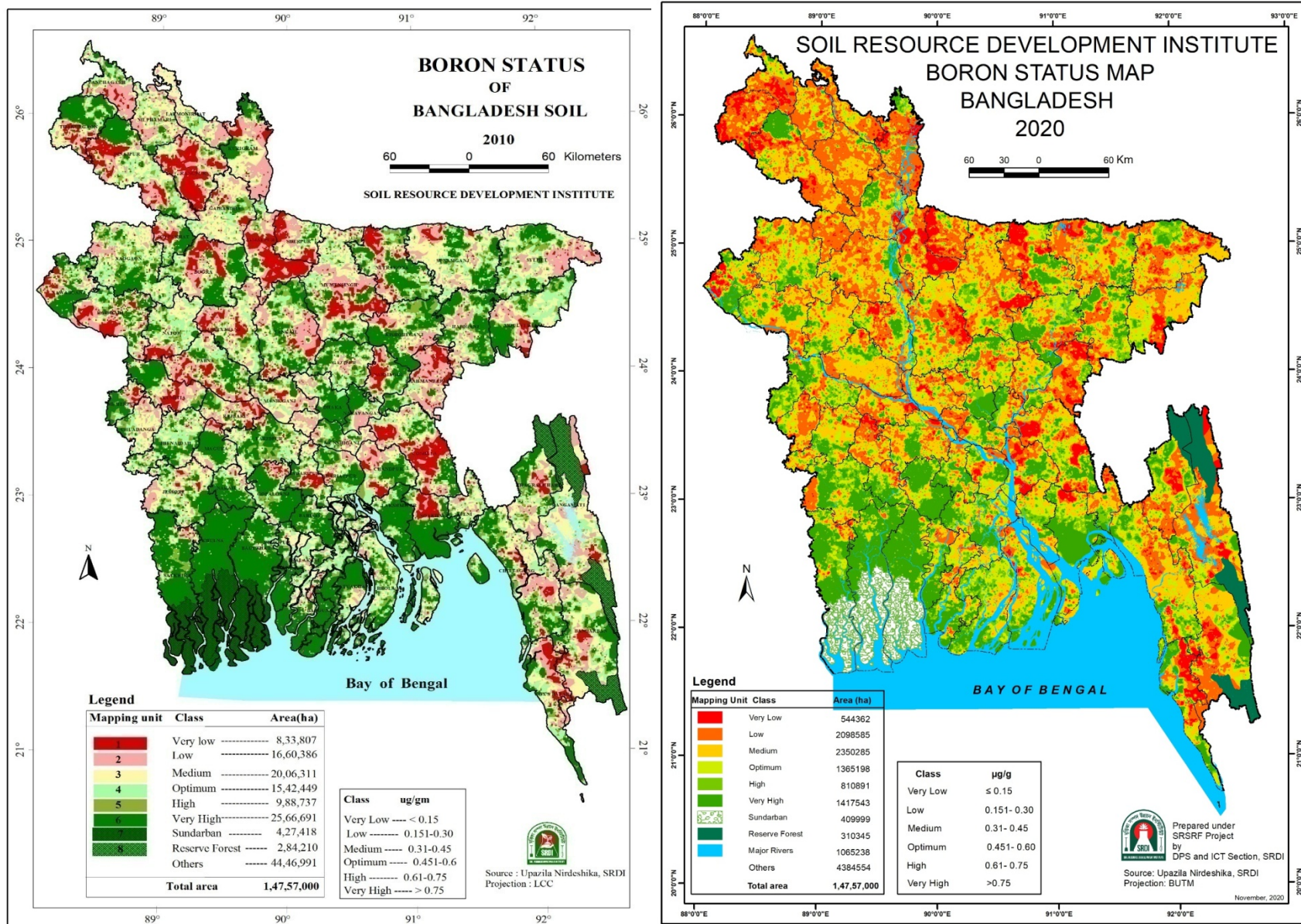


Fig. 4 Boron Status Map for Loamy to Clayey Soils, Year 2010 & 2020 in Bangladesh.

Table 4 Boron Fertilizers in Bangladesh

Govt. specification of different Boron fertilizers

Fertilizer	Minimum boron (%) by weight
Solubor	20.0
Boric acid	17.0
Fertibor	15.0
Granobor	14.6

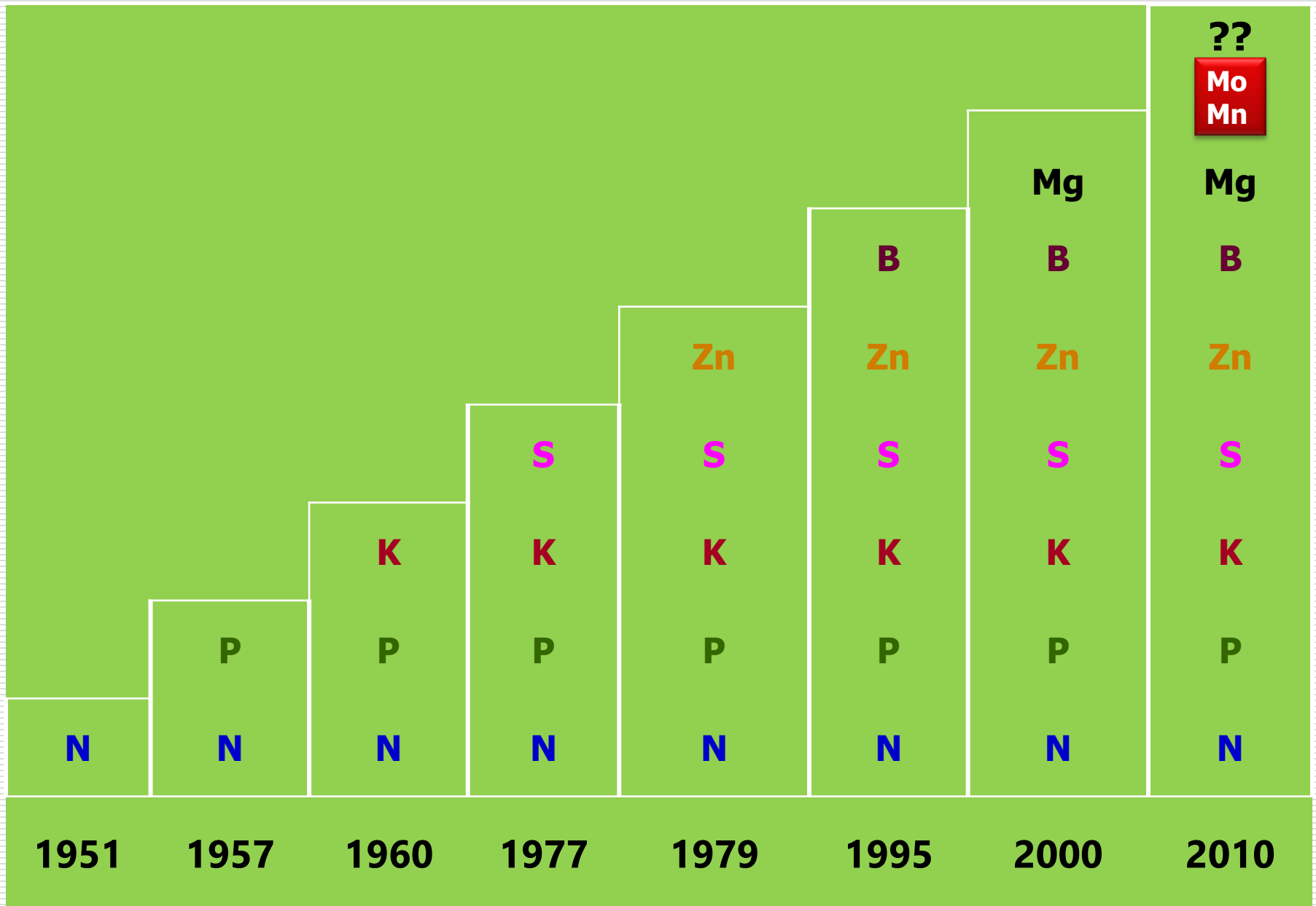


Fig. 5 Plant nutrients deficiency increasing with the advance of time in Bangladesh.

Bangladesh Context

Zinc and Boron are the Government approved micronutrient that are applied as fertilizers.

In most of the cases both of the fertilizers are applied at the stage of final land preparation in soil.

Some cases specially in vegetable and fruits these fertilizers are applied as foliar application.

It is established that foliar application of Zn and B fertilizers at different growth stage is much more higher than the soil application.

Farmers are showing less interest of foliar application in field crops due to high labor cost.

Conclusions

- **Current estimate suggested that almost half of the world population suffers from mineral deficiencies, primarily of iron and zinc and boron. Bio-fortification of with micronutrients in edible parts of crop can be achieved by utilizing soil and crop management.**
 - **We have to find out the maximum use efficiency of applied fertilizer specially micronutrients so that it can translocate to edible parts.**
 - **We the people deals with science, have the responsibility to harvest the maximum benefit of SSM for human, animal as well as soil health for the generation next.**
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Thank you

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