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## Rice Varieties with Multiple Traits for Intensive Cropping in the Coastal Zones of the Ganges

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**Session: Basin (Ganges) and Resilience**

### Key Message

Salinity is a major problem in coastal zones of the Ganges and is worsening with sea level rise, increasing vulnerability to food insecurity. New rice varieties are needed to help increase productivity and improve farmers' livelihoods, and this is becoming possible with the development of a new generation of salt tolerant rice varieties, allowing more flexible farming systems and offering new opportunities for intensifying the cropping patterns in these areas.

## Summary

Coastal zones of the Ganges are seriously affected by salinity and frequent floods and are vulnerable to sea water rise, bringing saline water further inland and causing even more serious salinity and floods in rice fields and for other crops. In some areas medium-deep water stays for over a month, which requires taller but high yielding rice varieties. With climate change, new types of rice varieties are needed to suite new intensive cropping patterns that can increase productivity and improve the livelihoods of farmers in these areas. Presently available modern rice varieties suited only limited areas in coastal zones that are more favorable. Our previous achievements through several projects including PN7 and PN10 of the CPWF-Phase 1 developed some salt tolerant varieties but most of them are not sufficiently adapted to fit into the new intensive cropping patterns intended for these areas. Besides tolerance to salinity, traits like short duration, non-photosensitivity, taller plants to withstand stagnant

water, submergence and cold tolerance, and even drought tolerance are necessary for specific areas. Recent efforts using modern breeding tools have introgressed quantitative trait loci (QTL) associated with salinity and submergence tolerance into mega varieties, which are now ready for evaluation. Moreover, new breeding lines with better salinity tolerance and with varying growth durations are ready for distribution to and evaluation by farmers. Furthermore, breeding lines combining tolerance of salinity and submergence were recently developed using marker-aided selection, providing varieties that can survive both saline and submerged conditions. These new generations of rice varieties will help in developing new more productive and less risky cropping systems for coastal zones.