Use of DNA fingerprinting to trace varietal purity in Groundnut Seed Value Chain

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Climate change significantly impacts agriculture due to unpredictable and extreme weather events. Increasing climate vulnerability highlights the need for crop varieties that can withstand the resilience to climate shocks. This necessitates the need for maintaining genetic purity in crop varieties to ensure the improvements imparted by the breeders are delivered to the farmers to gain optimum productivity and resilience. This helps in building trust in seed systems, ensuring that farmers are planting high-quality seeds that are capable of adapting to climate change. Odisha, India, a region highly dependent on agriculture faced groundnut seed shortage due to systemic challenges in seed production and farmer’s concerns about high rejection rates during the certification process, which significantly contributed to a sharp decline in the groundnut area by 51.7% and production by 30.5% of what it was in 1990. This study with 104 farmers across four districts is focused on key challenges they face and evaluates the efficacy of DNA fingerprinting in improving seed quality standards. The study indicated that only 37.5% of farmers ultimately sold seeds to the the seed company (Public sector/OSSC), while 58.6% opted to sell in the local market, and 3.9% directly to consumers as food due to low risk of rejection and higher market prices. Further, the DNA fingerprinting revealed, 46.0% of foundation seeds and 52.0% of certified seeds did not match the parent varieties. Thus, implementing incentives aligned with seed purity standards could reduce the diversion of seeds, maintaining the traceability of the supply chain and farmers’ loyalty to the formal seed systems.