While poorest farmers almost certainly enjoy the fruits of the plough and the hoe, whether and under what conditions modern agricultural technologies such as high yielding seed varieties, drip irrigation, or new cultivation practices benefit the poorest farmers, is an important empirical question. This study focuses on the barriers preventing the poorest farmers from realizing greater benefits from agricultural technologies. Using a sociotechnical approach which conceptualizes technology as inextricably linked to the institutional systems necessary for scale (Brooks, 1980), this study uses a mix of ethnographic research and survey data to study the sociotechnical causal mechanisms (STCMs) preventing the poorest farmers from realizing greater benefits from technology in Bihar, India. The chapter finds that in the context of Bihar, the primary STCMs preventing the poorest farmers from benefiting from agricultural technology are missing infrastructure and misaligned incentives. The STCMs that play a lesser role in preventing the poorest farmers from benefiting from agricultural technology include lack of individual farmer capacity, weak capacity for collective action, and missing market linkages. While these findings are specific to the context of Bihar, this study offers a novel framework for studying the impact of technology on poverty that can be used across contexts. Methodological approaches such as this one are important for ensuring that the poorest and most vulnerable groups are served by the global innovation systems across sectors from agriculture to energy to healthcare.