A4NH

2017 Annual Report

RESEARCH PROGRAM ON Agriculture for Nutrition and Health

CGIAR

Led by IFPRI

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FLAGSHIP 5 | Improving Human Health

Highlight 1: Ensuring Food Security and Human Health are Complementary Goals

In Africa, rice and malaria go hand-in-hand. Africa suffers 85 percent of the world's malaria mortality. Rice demand and production are growing in Africa, and the mosquito species primarily responsible for transmitting malaria in Africa breeds prolifically in rice fields. The consequences of this rice-malaria link are all too familiar to African rice farmers and their families: if you sleep without a bed net near an irrigated rice field, you can expect to be bitten nightly by dozens, or even hundreds, of hungry mosquitoes, putting you at great risk for malaria.

So how can rice cultivation in Africa be expanded without jeopardizing public health plans to eliminate malaria? What adjustments could make agricultural development part of the public health solution, not part of the problem?

Case studies conducted in Africa between 1995 and 2005 revealed, as expected, that mosquitoes were more abundant in rice-growing villages than in non-rice-growing villages. However, the levels of malaria in irrigated rice villages were the same as or lower than rates in non-rice-growing villages. Researchers determined that the economic benefits from growing rice enabled families and communities to better protect themselves from malaria, through access to resources like commercial mosquito nets and better health services. This "paddies paradox" made it appear that rice growing was contributing to development, not making the malaria problem worse

Of course, greater wealth and improved infrastructure did not get rid of the mosquitoes—it only made malaria easier to avoid. With the adoption of modern malaria control mechanisms over the last 10 years, malaria rates have dramatically declined across Africa, revealing some notable malaria "hotspots." A4NH researchers at the London School of Hygiene & Tropical Medicine examined studies done over time, finding that although irrigated areas may have had similar rates of malaria compared to non-irrigated areas in studies done when overall malaria levels were high, studies conducted after overall levels had fallen show that non-irrigated areas have lower malaria rates while malaria hotspots persist around irrigated areas.

From a broad perspective, as progress is made toward eliminating malaria, environmental features and agricultural activities that promote malaria transmission will likely be identified as obstacles to the goal, while those that suppress transmission will be seen as part of the solution. For example, innovative methods of irrigation, such as the "alternate wet-dry" method, do not create such a hospitable habitat for mosquitoes. However, adoption of these methods has been limited by the costs and logistical challenges involved. From a farmer's perspective, investing in new technologies and different cultivation processes only makes sense if others do too: one farmer shouldering increased expenses alone sees only harm as an individual, and no benefit from fewer mosquitoes if her neighbors don't do the same.

With the dilemma identified, in 2017, the A4NH researchers began to work with colleagues from AfricaRice to identify methods of growing rice that address both objectives: maximizing the yield of rice and minimizing the mosquitoes. While focusing on the primary consideration of increasing crop yield and minimizing costs, their work with other rice researchers will incorporate measurement of mosquito larval densities into their work, and compare production methods to find opportunities to reduce mosquito populations.

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