Highlight 1: Examining the Link between African Rice Production and Malaria

Rice farming is likely to expand in West Africa, reflecting rapidly increasing demand. It is well known that African malaria vector mosquitoes breed prolifically in rice fields. But in the past some doubt remained about the relationship with malaria because, while new rice schemes brought hordes of mosquitoes, they also brought improvements in infrastructure and household income that provided protection against malaria despite the mosquitoes. Meanwhile, non-rice villages, which often had poor health services, would have nearly no protection against mosquitoes, so malaria rates remained high. Since the initial introduction of new rice schemes, coverage by effective antimalaria interventions has expanded substantially and become much more equitable. Most recent studies confirm that malaria is now significantly more prevalent in rice-land villages than non-rice villages, suggesting that, as malaria comes under greater control, irrigated rice schemes may become malaria hotspots.

It is possible to manage the process of rice irrigation so as to minimize the number of mosquitoes in the water. Working with colleagues at AfricaRice, A4NH researchers at the London School of Hygiene and Tropical Medicine have realized that it may be possible to design an integrated strategy to build disease management into rice intensification programs. Together, the researchers have launched a trial intervention to reduce vector production.

The joint fieldwork, which will begin in 2019, has been designed to track mosquito productivity of alternative irrigated rice cultivation techniques to (1) identify how to grow rice in Africa without growing deadly mosquitoes and (2) assess effects of landscape change on the vectoral capacity of malaria vectors.

This new project, supported by the Wellcome Trust, will investigate the possibility that interventions aimed at mitigation of climate change could, with minor modifications, have substantial additional public health benefits.

The new work builds on and complements other work in this area being conducted under A4NH. Conscious that irrigated rice is a major source of methane emissions, rice experts have developed techniques, such as “alternate wet-dry” irrigation, to reduce methane production by allowing rice fields to dry out midseason. These are now being scaled up in Asia and tested by various groups in Africa, especially the CGIAR Research Program on Rice and AfricaRice in Côte d’Ivoire. Meanwhile, and independently, public health researchers have developed methods of “intermittent irrigation” to minimize mosquito breeding in rice fields; these methods also involve drying out the fields. While the two methods have common features, they are not the same.

Under the new grant, researchers will work to compare these methods directly and in detail, measuring the key biological outcomes related to mosquitoes, methane, and rice yields, as well as farmers’ perceptions, and will try to identify a hybrid method that could combine the benefits of both.

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