

“Selling pesticides like biscuits” – challenges of pesticide governance in Zambia

Use of pesticides is rapidly rising in many parts of Africa. While farmers cheer them as powerful substitutes for manual weed and pest control, the precarious institutional environment has been resulting in the uncontrolled use of these inputs, frequently with alarming consequences for the environment and health. An exploratory study in cooperation between Germany’s University of Hohenheim and the Indaba Agricultural Policy Research Institute (IAPRI) in Zambia looks for ways to address the underlying governance challenges.

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While some pesticide dealers in larger towns are professional and officially registered (left), many others in suburbs and rural areas operate in an informal, improvised setup or even as mobile vendors (right).

Photos: Louis Schwarze

While African agriculture was long believed “organic by default”, recent evidence shows that pesticide use is more widespread than often believed and is rapidly surging, a trend that has been coined a pesticide “revolution”. Among the main drivers are imports of low-cost, generic pesticides, mainly from Asia. After key pesticide ingredients such as glyphosate lost patent protection at the beginning of the 2000s, Asian manufacturers rapidly scaled their production capacities, cut production costs and started to supply large volumes across the developing world, including African countries. These generic products are usually imported in bulk and marketed by local traders under plentiful house brands which are competing with traditional international agrochemical companies like Bayer, Syngenta and Dupont for market shares. In response, pesticides have become much more affordable and accessible, especially to smallholders. At the same time, pesticide demand has increased due to labour shortages for weeding and manual pest control during the peak

seasons, which is exacerbated by urbanisation, demographic change and commercialisation of farming. Use of insecticides has also gone up owing to outbreaks of invasive pests (e.g. the fall armyworm) and climate change, leading to increased pest pressure.

Pesticide use in agriculture has been discussed controversially, at the latest since biologist Rachel Carson’s book *Silent Spring* published in 1962, because of its potential environmental and health risks. Nonetheless, given their agronomic utility, pesticides are considered indispensable by most farmers and governments. In Africa, pesticide adoption creates opportunities for food security and rural livelihoods through the reduction of pre- and post-harvest losses and the heavy toil of farming, affecting especially women and youth. However, at the same time, there can be severe health and environmental hazards such as pesticide poisoning, contamination of food and water, and loss of biodiversity that occur because of inappropriate management, renunciation of

protective equipment and use of highly toxic ingredients. Given these potential risks, it is widely accepted that strong regulatory institutions are required to minimise negative impacts. African countries are excessively affected because existing regulatory institutions are often malfunctional. In the face of the rapid surge in pesticide supply, regulatory capacities are further strained, and fail to enforce basic regulations and monitor the growing pesticide trade and use. In effect, governance challenges such as informal trade of unregistered and fraudulent products, lacking knowledge of pesticide management, limited use of protective measures by farmers, the dumping of pesticide containers into the environment and the excess of maximum residue levels (MRLs) in fruits and vegetables are left largely unaddressed. Internationally accepted concepts such as the International Code of Conduct on Pesticide Management and Integrated Pest Management (IPM) lack implementation, and many hazardous pesticides have still not been banned in numerous countries.

The research project

In a recent research project, we studied such governance challenges of pesticide management and its institutional environment in Africa in detail, with a specific focus on why they occur and how to address them. In the study, we systematically identified the various challenges that affect private, public and civil governance of pesticides along the pesticide life cycle, using the literature and field research in Zambia.

The research combined four types of qualitative data collection. First, we reviewed Zambian pesticide laws and policies and compared them to international reference documents to identify eventual gaps in their design and implementation. Second, we did 13 participatory mapping sessions (Net-Maps) with key stakeholders along the pesticide life cycle to identify key actors, linkages and their influence levels as well as key constraints. To specify critical aspects, we interviewed an additional 87 key informants representing diverse stakeholders (including private sector, government agencies, research and NGOs). Finally, pesticide management practices and perceived impacts were assessed in 18 farmer group discussions (with 159 randomly sampled farmers), using Participatory Impact Diagrams, which combine mind maps and scoring to reconstruct positive as well as negative causal impact chains graphically in groupwork. Complementary insights were gained through site observation of pesticide markets and interviews with pesticide traders. The field research took place between October and December 2021, in the capital Lusaka and in selected districts in the Eastern Province.

How pesticide use is perceived

Starting at the farm level, the results of the Participatory Impact Diagrams show a very positive reception of pesticides in rural communities. Most participants rated pesticide net-impacts on their lives either very positive (37.5 %) or positive (24 %). Even though compared to that, for many participants, negative impacts were a “lesser evil”, they were still substantial, causing a large share of participants to be undecided (37.5 %). Yet, only two participants (1 %) stated a larger negative impact. Benefits of pesticides most relevant to farmers were: higher yields and incomes and fewer risks thanks to more effective crop protection, reduced time and workload of farming freeing-up capacities for economic diversification or social activities, and enhanced food

security through long-term preservation of grain (through fumigation). The most relevant downsides were temporary health problems (e.g. skin and eye irritations, headaches and vomiting), risk of chronic diseases (e.g. cancer), suicide cases and contamination of food and animal feeds (see table). Other slightly less frequently mentioned impacts included loss of utile flora and fauna such as edible insects, edible weeds and bees, and killing of wildlife through hunting and fishing with pesticides, resulting in less diverse diets and loss of food sovereignty.

Management errors (mentioned by 67 % of key informants), use of highly hazardous pesticides (67 %), low adoption of protective equipment (63 %) and limited knowledge (73 %) were cited most frequently by key informants as causes of negative health (53 %) and environmental problems (33 %) at farm level. Other reported challenges included limited adoption of integrated pest management (IPM) (27 %) and dumping of pesticides (containers) (47 %). Existence of these challenges was also confirmed through interviews with farmer groups. The underlying economic problems we identified are externalities, imperfect information and bounded rationality. Externalities are negative effects that are caused but not borne by private pesticide users. Information on safe/effective pesticide use and potential risks among pesticide users is scarce, because its acquirement is expensive (high transaction costs) and it is less demanded than socially desirable (merit good effect) and risks/benefits of pesticides are systematically under-/overestimated due to bounded rationality (e.g. optimism and normalcy bias or misperception of likelihood).

Wide-ranging governance challenges

Examining the supply chain of pesticides in Zambia revealed that many key informants approved the “pesticide revolution” hypothesis, that is the rapid expansion of pesticide use, which is also associated with the emergence of many new pesticide traders and brands. In Zambia, this was reinforced through pesticide subsidies, for example in response to the fall armyworm. After the outbreak of the fall armyworm in 2016, the Zambian Government procured repeatedly large quantities (in total more than three million US dollars) of various insecticides to farmers as an emergency response. Moreover, through transition to an e-voucher-based farm input subsidy programme (FISP) introduced in 2016, pesticides were included as selectable inputs. While the proliferation of pesticide traders has increased pesticide affordability and accessibility, it has caused supply chain governance to deteriorate in various ways. First, suppliers of generic pesticides, unlike traditional suppliers such as Bayer or Syngenta, lack corporate social responsibility policies including voluntary activities such as capacity building and monitoring of cooperating dealers, cooperation with policy-makers and other activities to reduce pesticide hazards. For instance, while premium suppliers voluntarily phased out highly hazardous pesticides (HHPs) in Zambia, generic importers keep stocking them. Second, many small, informal pesticide retailers are emerging in suburbs and rural areas which lack minimum requirements in terms of qualification and pesticide storage and packaging. Sometimes, pesticides are even sold by street/mobile dealers or grocery stores and repacked into unlabelled plastic bags.

Most-cited positive and negative impacts of pesticides in Participatory Impact Diagrams

Positive impacts		
Impact	% of FGs mentioning impact	Average relevance score*
Higher longevity of stored grain	88 %	2.00
More time available for social activities	88 %	2.00
Effective crop protection/ less yield loss	81 %	2.00
Less labour stress/ costs	75 %	1.89
Capacities to expand/ diversify farm	63 %	1.88
Negative impacts		
Acute health problems (rushes, headaches, etc.)	88 %	1.64
Suicide attempts**	81 %	0.54
Food contamination	81 %	1.50
Poisoning of domestic animals	69 %	1.14
Chronic health symptoms	69 %	1.14

* Relevance of impacts to farmers was scored on a 3-step scale from 0 = low relevance to 2 = high relevance. FG = farmer group. ** The reason for the low relevance score for suicide attempts is that while they were referred to by many farmer groups as an impact of pesticide use, the groups also argued that there was no direct causal relationship since a suicide was the responsibility of whoever committed it and, furthermore, alternatives to pesticides were available.

Three major governance challenges of pesticide traders were pointed out by key informants – low qualification (49 %), hawking (29 %) and counterfeiting (24 %). The identified underlying market failure is information asymmetry, meaning that farmers cannot assess quality of advice and products supplied by pesticide dealers at the time of the purchase. This leads to adverse selection whereby fraudulent, dishonest traders have a competitive edge as they can offer cheaper products. One widespread phenomenon is hawking, i.e. biased, pushy marketing tactics without mentioning risks which was described by one trader as “selling pesticides like biscuits”. The information asymmetry problem also affects food markets where pesticide contamination cannot be immediately seen by consumers. Previous to our research, pesticide-contaminated lettuce had caused a severe case of food poisoning in Zambia, which was often referred to by respondents.

While the Government does maintain an agricultural extension service, the Ministry of Agriculture has so far focused little on handling pesticides and the risks this entails. Pesticide regulation is chiefly up to the Environment Ministry, and deliberations between the two departments have as yet not resulted in any sufficient prioritisation of the issue on the ground.

Weak regulatory framework and control mechanisms

Our analysis of the institutional environment showed complete or partial absence of public pesticide governance along all stages of the pesticide life cycle. This can be attributed to two major sets of governance challenges.

First, the review of the pesticide law showed several gaps compared to international standards. Especially, the mandates of regulatory actors are not well defined. Moreover, pesticides are not addressed in current agricultural, environmental and health policies. Several highly hazardous pesticides (such as Dichlorovos, Monocrotophos or phosphides) have not been banned, which was criticised by major private and civil stakeholders (53 % of key informants). According to farmer groups, these HHPs are regularly involved in suicide attempts and fatal accidents. Large importers felt the pesticide registration process disadvantages new, potentially less harmful formulations by demanding for tedious testing procedures (29 %). The private sector, academics and NGOs (18 %) identified lack of political will and sense of urgency to tighten and update regulations among public

authorities as the primary bottleneck, driven by a lack of evidence about the true social and environmental costs in combination with opaque policy processes as well as low accountability to affected communities and civil-society organisations (CSOs) that were not participating in the policy process (16 %). Various inspectors and researchers uttered that pesticide regulation, being a joint matter of environmental, health and agricultural ministries, was sidelined and suffered from coordination failures (42 %). Regulatory capture from the private sector could be another reason but was not explicitly mentioned.

Second, enforcement of regulations (57 %), monitoring of pesticide impacts (49 %) and training of pesticide dealers and farmers (56 %) is very infrequent. The main governance challenge is limited funding and staffing of public agencies (53 %) in combination with high transaction costs, due to the remoteness and sheer number of farmers as well as bureaucratic work mode in and between agencies. Consequentially, inspectors are “thin on the ground” and rarely able to leave the provincial capitals (private sector, academia). Public inspectors confirmed that inspections of pesticide dealers and border controls were irregular, whereas monitoring of pesticide quality and food contamination was completely absent, especially because laboratories are not available (33 %). Inspectors also stated that environmental impacts are only registered on a complaint basis. Researchers and NGOs lamented that trainings and sensitisation of pesticide dealers and farmers were not included in public budgets, and hence largely left to the private sector and development projects. According to them, the agricultural extension service was officially in charge of training farmers on pesticide management, but in practice its outreach was limited and agronomic topics were prioritised.

The way forward

To address extensive challenges of pesticide governance in Zambia, fostering political will for stricter regulation and enforcement will be pivotal, especially to fully ban HHPs. Therefore, more evidence and transparency of the true social and environmental costs of pesticide use as well as effective accountability mechanisms are required. According to key informants, international organisations and research can play a major role here, as they have much influence on domestic policy-makers (mentioned by 20 %), e.g. by coordinating stakeholders, elaborating alternative policies, analysing pesticide impacts and supplementa-

ry funding. Consensual strategies to empower and participate civil society organisations (13 %) could help to create accountability for stricter pesticide regulation while barriers to private sector influence must be installed simultaneously. At the same time, research on innovative, transaction cost efficient enforcement models are required. Hybrid models involving private, public and civil actors could be more effective than pure public top-down regulation. For instance, activities such as risk sensitisation of farmers, container recollection and qualification courses for pesticide dealers and spraying agents could become mandatory for pesticide importers. Additionally, regional harmonisation of pesticide legislation within the Southern African Development Community (SADC) could free-up valuable capacities through joint registration and border control. Such harmonisation has been actively promoted, e.g. via the Southern African Pesticides Regulators Forum (SAPReF) and the SADC Guidelines on Pesticide Management and Risk Reduction passed in 2019 but not yet translated into national law. Ultimately, a minimisation of pesticide use through further promotion of IPM or perhaps even taxation will be pivotal, but the vision of a completely pesticide-free agriculture seems hardly realistic and is not reflected in farmers’ preferences. Hence, effective regulation of pesticides is crucial.

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