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NATIONAL IMPLEMENTATION OF REGIONAL PESTICIDE POLICIES IN WEST AFRICA: THE GAMBIA CASE STUDY REPORT

Boubacar Diallo and Oyinkan Tasie

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AGRA	Alliance for a Green Revolution in AfricaAGRHYMET Agrhymet Regional Centre (Centre Régional de Formation et d'Application en Agro météorologie et Hydrologie Opérationnelle)
APMU	Agricultural Pest Management Unit
DAS	Department of Agricultural Services
GHE	Gambia Horticultural Enterprise
GPMB	Gambia Produce Marketing Board
HCPCMA	Hazardous Chemicals and Pesticides Control and Management Act
IPM	Integrated Pest Management
MH	Ministry of Health
MOA	Ministry of Agriculture
NARI	National Agricultural Research Institute
NEA	National Environmental Agency
NEMA	National Environment Management Act
CILSS	Permanent Interstates Committee for Drought Control in the Sahel (Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel)
COAHP	West African Committee for pesticides registration (Comité Ouest Africain d'Homologation des Pesticides)
CPI/OUA	Inter-African phytosanitary Council for the Africa Union (Conseil Phytosanitaire Interafricain de l'Organisation de L'Unité Africaine)
CPZHAOC	Comité Phytopharmaceutique de la zone humide de l'Afrique de l'Ouest
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
INSAH	Institute of Sahel
OCLALAV	Organisation commune de lutte antiacridienne et de lutte anti aviaire
OICMA	Organisation inter-état de contrôle des criquets migratoire en Afrique
OTA	Office of Technology Assessment of the U.S. Congress
POPs	Persistent Organic Pollutants
PSA	Provisional Sales Authorization
SCP	Sahelian Pesticide Committee (Comité Sahélien des Pesticides)
SPIA	Société des Produits Industriels et Agricoles du Sénégal
WAEMU	West African Economic and Monetary Union
USAID	United States Agency for International Development
WAEMU	West African Economic and Monetary Union (UEMOA in French)
WHO	World Health Organization

1. INTRODUCTION

1.1. Context

This paper examines the pesticide[1] market and its regulatory framework in the Gambia in relation to regional pesticide policies and markets. In 1974, the Gambia became a member of the Permanent Interstate Committee for Drought Control in the Sahel (Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel {CILSS}), and thereby committed to implementing its regulations.[2] The CILSS was created in 1973 in response to the devastating drought in the Sahel, and has since produced regulations on pesticides.[3] In addition, the Economic Community of West African States (ECOWAS) also has regulations on pesticides and the Gambia is a Member State. How these regulations have been implemented in the Gambia is important in determining the level of progress made achieving even implementation of mutually-agreed upon regional pesticide policies. As part of a seven-country set of comparative case studies, this work collectively aims to explore the reasons for uneven rates of country implementation of regional agricultural input policies.

West African countries have long recognized their strong regional interdependencies in agricultural and food markets. For many centuries, long distance trading routes have linked different agro-ecological zones within the region. In more recent years, particularly since the Sahelian droughts of the early 1970s, cross-border movements of people, livestock, farm inputs and outputs have underscored the importance of regional interdependencies for ensuring food security.

Beginning in the 1990s, regional organizations such as CILSS and ECOWAS[4] have increasingly promoted regional harmonization of agricultural input policies as a means of accelerating agricultural productivity growth, increasing technology spillovers and improving national and regional food security. Given that the region's collection of multiple small countries straddle common agro-ecological zones, the introduction of common regional regulations throughout the region holds the promise of enabling input suppliers to exploit economies of scale in input production, procurement and distribution as well as prospects for technology spillovers (Alston 2000; Haggblade 2013). Hence, not surprising that countries in

[1] Pesticides include three categories of agricultural inputs: herbicides, insecticides and fungicides.

[2] United Nations Treaty Series No. 876, 'Agreement Between the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) and the World Meteorological Organization'

[3] CILSS is an intergovernmental organization including nine Sahelian countries stretching from Cape Verde to Chad created in 1973 to coordinate efforts at drought prevention, mitigation and relief in the Sahel. Original CILSS members included the six francophone countries of Senegal, Mauritania, Mali, Burkina Faso, Niger and Chad as well as three nonfrancophone countries of Cape Verde, Guinea Bissau and the Gambia. Starting in 2011, CILSS expanded its membership to include the four humid-coastal countries of Benin, Cote d'Ivoire, Guinea, and Togo. Along with this expanded membership, CILSS broadened its mandate to promote regional food security and natural resource management. Increasingly, CILSS programs stress the linkages between the Sahelian states and countries of the humid coast.

[4] Founded in 1975, the Economic Community of West African States (ECOWAS) includes 15 member states: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Ghana, Guinea, Guinea Bissau, The Gambia, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Largely overlapping with the membership of CILSS, ECOWAS nonetheless excludes Mauritania and Chad (both CILSS members) while including non-CILSS members Nigeria, Ghana, Sierra Leone and Liberia. ECOWAS aim to create a West African free-trade zone and eventually a common monetary union for a region with an estimated 2010 population of about 300 million people.

West Africa promote regional collaboration, with interestingly strong bonds developing among the francophone members of WAEMU[5] and CILSS.

While regional policies governing inputs such as fertilizer and seeds have been well studied (Keyser et al. 2015), regional pesticide policies and markets have not. In addition to filling this gap, the pesticide studies in this series offer a potentially instructive contrast between the longtime CILSS member countries, which began to implement common regional pesticide regulations in 1992, and non-CILSS ECOWAS member countries, which have recently adopted the CILSS regulatory framework as its model for managing regional pesticide policies in the humid coastal zones.

The CILSS member countries have implemented harmonized regional pesticide policies among its member states despite very different levels of human, administrative and scientific capacity. For this reason, ECOWAS has modeled its West Africa regional pesticide policy regulations on the CILSS system. In April 2013, ECOWAS formally asked CILSS to help in expanding regional pesticide implementation to the coastal countries.[6] This staggered implementation of regional pesticide policies provides a learning opportunity. As a point of departure, the early adopting CILSS member countries provide a window for exploring how the Sahelian countries managed to implement regional pesticide policies, even in countries with low levels of human and physical capital. Lessons there should help to pinpoint ways in which ECOWAS can improve future country implementation of regional inputs policies more broadly throughout the West Africa region.

1.2. Objectives

The Gambia case study aims to achieve the following goals:

- provide a profile of the structure and dynamics of local pesticide markets
- examine the status of national implementation of regional pesticide policies
- identify gaps and problems in implementing regional pesticide policies

In a second phase, by comparing these results with case study findings from other countries in the region, this work aims to provide an understanding on why some countries move rapidly to implement agreed-upon regional policies, while others move slowly or not at all. Ultimately, these comparisons aim to help identify key factors favoring country-level implementation of agreed-upon regional agricultural policies in West Africa.

1.3. Methods

The present study constitutes one of seven companion national studies of regional pesticide policy implementation in West Africa. The countries examined include three longtime CILSS members (Mali, Senegal and Gambia) as well as four coastal ECOWAS members expected to participate in the newly designed humid zone pesticide regulatory body (Côte d'Ivoire, Ghana, Guinea and Nigeria). Using a standard research protocol, the Gambia research team spent one week conducting interviews with national regulators, key private sector importers,

[5] The West African Economic and Monetary Union (WAEMU), known as UEMOA in French and founded in 1994, includes the eight francophone countries sharing the common currency of the CFA franc: Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal et Togo.

[6]

and distributors, retailers and users of pesticides. Diarra (2016) provides the full research protocol applied during these case studies, including market profiles, respondent selection and interview guide, while Annex 1 provides a list of persons interviewed in the Gambia. In addition to detailed discussions with regulators and private sector actors, the authors have analyzed available secondary data on pesticide prices, import quantities and farm-level adoption.

2. THE GAMBIA PESTICIDE MARKET PROFILE

The Gambia has a narrow economic base, relying heavily on agriculture. The main agricultural sub-sectors comprise annual field crops, horticulture and livestock. Crop production is diversified. Cash crops such as groundnuts and cotton are grown in the up-land areas and rice in lowland, in rain-fed swamps or under irrigation areas. Other subsistence cereal crops are grown such as maize, sorghum and millet. The Gambia has 3 main agro-ecological zones namely Sahelian, Sudan-Sahelian and Sudan-Guinean zones: (i) the Sahelian Zone is characterized by a dry season savannah vegetation and a Sahelian micro-climate. Rainfall is less than 600-mm annually and drought tolerant crops such as cassava, sesame, cowpea and millet are grown; (ii) the Sudan-Sahelian Zone lies within the 600 to 900 mm rainfall area, with an up-land areas well suited to groundnut, cotton and sorghum. It includes a flood plains along the Gambia River associated with a lowland valley systems suited to rice under swamp irrigation; (iii) the Sudan- Guinean Zone lies within the 900 to 1200 mm rainfall. The principal crops cultivated are early millet, groundnut, rice (rain-fed upland and lowland, irrigated lowland, mangrove and mangrove salt-tolerant), maize, vegetable, sesame and cowpea (Secka, 2011). According to Secka (2011), a wide variety of pests and diseases attacks cereals, cotton and vegetable crops. This causes substantial economic damage and crop losses. Although other pest control methods exist (i.e. biological), producers depends on chemical pesticides as means to control pests effectively.

2.1. Product composition

Data from field interviews with the three largest private distributors of agrochemicals in the Gambia, namely, Gambia Horticultural Enterprises Co. (GHE), Haja Latrikunda and Sangol distribution firm shows that insecticides dominate the market share. They are most commonly available and sold. Next to insecticides is herbicides, particularly where used for cotton, groundnuts and horticulture. Table 1 below presents the list of pesticides found at GHE the day of the interview, listed in the following order (insecticides, herbicides, fungicides).

Table 1. List of pesticides found at GHE

Name of product		Uses
Commercial name	Common name	
Insecticides		
Deltamethrin 25EC	Deltamethrin 25g/L	Controls a wide range of insect and mite pest such as army worm, borers, aphids etc of cabbage, soy bean, rice, peanut, maize, cotton, uncultivated land, and sanitary purposes
Abamectin 1.8EC	Abamectin 18g/L	An acaricide, miticide, insecticide, and seed protectant for pest such as spider mites, thrips, leafminers, bedbugs, etc on roses/flowers, vegetables, citrus, pear, and nut tree crops, and for sanitary purposes
Dimethoate	Dimethoate 40% EC	Systemic organophosphate insecticide and acaricide with contact and stomach action suitable for control of a wide range of sucking and chewing pest including aphids, whiteflies and mites on rice,

		orange tree, vegetables, cotton, sweet potato, and sorghum
Cypermethrin	Cypermethrin 10%EC	A pyrethroidal insecticide extremely active against the most difficult insect pests such as cut worms, whitefly, bores, fruit worms, plant lice, flies of tomato, pepper, okra, mangoes, cashew, citrus trees, and for domestic pest
Dexban 48% EC	Chlorpyrifos 48%	An organophosphorus insecticide for soil and foliar pest of both biting and sucking insects such as termites fruit flies, aphids, army worms red spider mites etc on vegetables, fruits, field crops, buildings, and domestic pests
Seedox	Imidachlorpride 10% + metalaxyl 10% + carbendazine 10%	Seed treatment effective in preventing and killing of Nephotettix cincticeps, Delphacidae, Phytophthira, Drosophila, weevils, riceborer, Bemisia tabaci etc in rice, cotton, vegetables, fruit trees, maize, and potato seeds and crops
Herbicides		
Yuperstar	Propanil 360g/L	Propanil is used to control various kinds of weeds and grasses especially effective for cockspur grass, barnyard grass, broadleaves to weeds on rice fields
Pendimethalin 33 EC	Pendimethalin 33%	For the control of annual, perennial, and aquatic weeds on spring soybean, spring corn, summer corn, cotton, peanut, potato, rice, and onions
Quizar super	Quizalofop-P-Ethyl 100g/L	It is a selective, post-emergence phenoxy herbicide used in the control of annual and perennial grass weeds in cotton, vegetables, peanut, potato, soy, sugar beets etc
Glyphosate 41%SL	Glyphosate 41%	Used in the control of green annual weeds (grasses and broad leaves, ryegrasses) perennial weeds (bamboo, dlady grass, couch), pampas grass, woody weeds, mutgrass, pasparum, and aquatic weeds
Nostok	Nicosulfuron 40g/L	Selective and systemic post-emergence herbicide for maize, sorghum, and millet
Fungicides		
Yuhomil	Metalaxyl 8% + Mancozeb 64%	A good mixture of systemic fungicide by contact: quick foliar absorption (Metalaxyl) and long residual activity (Mancozeb) for the control of downy mildew, late blight, anthracnose, alternaria spp etc on cauliflower, lettuce, head cabbage, onion, melon, water melon, potato, cucumber, vine, and tomato
Prochlor super	Prochloraz 25%	A broad spectrum fungicide for the control of powdery mildew, anthracnose, and spot on peanut, orange, rice, mango, and other application

These pesticides are all manufactured in China by Yufull Industry C. Ltd[7], with no CSP authorization label.

[7] Yufull Industry Co., Ltd. is a Chinese high-tech company specialized in research, producing and trading agrochemicals.

For Haja Latrikounda (second major seller), insecticides for vegetable crops dominate but her sales of herbicides are nowdays substantial in terms of volumes. The store was created in 2002. In volume she sells more herbicides. She sells insecticides for vegetables all coming from Senegal (mainly from Tropicasem and SPIA): Deltametrin, Dicofol, Pacha, Abamectin; herbicides: Propanyl (500 dalasi/liter), Glyphazate, Stomp (now stopped); fungicide: Mancosep, Manep, Solphos. She never faced quality problems from clients. She is been controlled one or two times per year by NEA inspectors who check usually preemption dates, products quality and storage environment.

According to GHE, Haja Latrikounda and Sangol firms, who supply around 50 small retailers located in the main markets and loumos, the demand for insecticides and herbicides has increased significantly in the Gambia. Some details of these firms (extracted from the web) are given below.

"Gambia Horticultural Enterprises Co. Ltd (GHE) has been created in Banjul in 1990. It has been exporting agricultural products for over 18 years now and has acquired over the years more than 247 acres of farmland. GHE is an important Gambian producer and exporter of out-of-season tropical fruits and crop vegetables such as mangos, French beans, hot chilies (Capsicum annuum), Pawpaw, lemons, Eggplants, watermelons and squashes and freshly cut flowers. Its markets are maily to European countries such as the UK, Netherlands, France and the rest of the EU. It supplies also inputs to the local market. The company is the Gambia's main distributor of farm and botanical seeds, agricultural equipment and farming inputs which includes agro-chemicals such as pesticides, fertilizers, fumigants. GDH has also a garden center which sells locally produced Gambian honey, vegetables, fruit, Wonjo and imported drinks. GHE also has a professional, registered pest control unit that aims to use its expertise to eradicate problems caused by cockroaches, termites, rats and mice. They sell rat poisons, traps and spray chemicals against insect pests. GDH has also a team of professional landscapers for hire for major establishments such as hotels and restaurants. GHE imports herbicides for its exports products, however in the conventional way. The last 5 years, the demand for insecticides and herbicides increased significantly. GHE sells mostly insecticides (chlorofingos-against termites), dimite or systonic-against white flies, deltametrin for horticulture). GHE sells herbicides (glyphosate, penmetaline, propanyl, kinzar, sulforum) and fungicides (metalaxine, mancozine, chloroco-clorase, methaurginole). The Owner (Mr Cisse) is also representing the Gambia private sector in the National Environmental Agency (NEA) committee. The latter consists of all stakeholders (health, environment, agriculture, etc.). The committee is not meeting regularly for pesticide issues. The registrar is doing all the work regarding pesticides. " (substantial information is extracted from the web).

"Haja Latrikounda and Farba Seck her husband (Dakar phone 776460010, e-mail: entrepriseaeb38@yahoo.fr), are agricultural input sellers who own a store at Latrikounda. The store was created in 2002. In volume, Hadja sells more herbicides. She sells insecticides for vegetables all coming from Senegal: Deltametrin , Dicofol, Pacha, Abamectin; herbicides: Propanyl (500 dalasi/liter), Glyphazate , Stomp (now stopped); fungicide: Mancosep, Manep, Solphos. She has never faced quality problems with clients. She has been controlled one or two times per year by NEA inspectors who check usually preemption dates, products quality and storage environment. The clients stick with them

because of advice they provide. Mr Farba Seck (the husband) is also an Ag-technician in horticulture and his wife is practicing horticulture. Most of their sales are with retailers and individual producers. They apply rarely to State bid. According to them, there exist very few informal products (counterfeits) in the Gambian market. They sell also seeds and most of the products sold comes from Senegal particularly from Tropicasem". (substantial information is extracted from the web).

"The Sangol distribution firm (Sangol Farms Limited) was founded in 1988 at Bakau by its proprietor Mr. Pierre Sarr. The company has a retail garden center and is a wholesale importer and dealer of agricultural inputs such as fruit and vegetable seeds, fertilizers, pesticides, herbicides and other agro chemicals. It also sells gardening equipment such as hosepipes, wheelbarrows, sprinklers, trowels etc. to domestic garden owners and tractors to commercial agri-businesses, animal feed production, groundnut fumigants and jute bags" (substantial information is extracted from the web).

According to Secka (2011), "the types of pesticides used in cereals and vegetable productions are variable and are mostly purchased from the local dealer's station at Weekly Markets (Lumos) without proper labels. Some producers are using other biological alternatives for protection on their vegetable crops. Most of the time, pesticides are used without proper protective gears, possibly poisoning themselves".

Figure 1. Insecticides and other inputs sold at the weekly markets (Lumos)

The major pesticide importers (GHE, Haja and Sangol) reported that there exists a very few of counterfeit and unregistered imitation products available on the Gambian market, although as reported by Murphy[8] (2005) a significant percentage of the pesticide products sold at local markets in the Gambia in 2005 are considered extremely hazardous. Given highly porous border crossings into the Gambia from Senegal, smuggled pesticides may arrive in the Gambia. The traders we interviewed estimate that unregistered or counterfeit herbicides account for less than 5% of volumes of pesticides sold domestically. However, regulators believe the share may be much higher given that many products are repackaged in unmarked containers (Figure 1) and some imported pesticides are labeled with trade names registered by other firms.

[8] However, Murphy study focused on the effects of insecticides spray against mosquitoes.

2.2. Farm-level demand

Pesticides are used in The Gambia on major export crops including groundnut and cotton. Vegetables and horticultural farmers account for the overwhelming majority of insecticides applied. Because of the need to spray two-three times during the crop cycle, the cotton producers use different pesticides in large quantities. The following tables are extracted from Faye (2006). They show major pest crops and diseases crops in The Gambia.

Table 2. Major pests of crops in The Gambia

Major Pests of crops			
No.	Name	Crops	Prevalence
1.	Red spider mites	Vegetables	High
2.	Aphids	Vegetables	High
3.	Whireflies	Vegetables	High
4.	Diamond-back moth	Vegetables	High
5.	Fruit worms	Vegetables/cotton	High
6.	Thrips	Vegetables	High
7.	Plant hoppers	Vegetables/ Cereals	High
8.	Fruit-flies	Vegetables/fruit trees	High
9.	Locusts/grasshoppers	Cereals/ Vegetables	High
11.	Blister Beetles	Cereals	High
12.	Armyworms	Cereals	High
13.	Hairy caterpillars	Cereals/Vegetables	High
14.	Mango Mealy bug	Mango	High
15.	Seed bugs	Grains/nuts	High
16.	Millipedes	Groundnut	High
17	Rodents	All crops/products	High
18.	Birds	Cereals/Vegetables	High

Source: Pest management unit of Department of Agricultural services DAS

Table 3. Major diseases of crops in The Gambia

Major diseases of crops			
No.	Name	Crops	Prevalence
1.	Nematodes	Vegetables	High
2.	Fruit-rot	Vegetables	High
3.	Fusarium	Vegetables	High
4.	Early blight	Vegetables	High
5.	Late blight	Vegetables	High
6.	Bacterial wilt	Vegetables	High
7.	Downey mildew	Cereals	High
8.	Smut	Cereals	High
9.	Blast	Cereals	High
11.	Mosaic	Cereals	High
12.	Rosettes	Groundnut	High
13	Weed Complexes	All crops	High

Source: Pest management unit of Department of Agricultural services DAS

There is inadequate recording of pesticides use by farmers in the country and detailed survey is required to actually get the national picture. According to Faye (2006), almost all the pesticides (insecticides, acaricides, nematicides, fungicides, pyrethroïds, herbicides) that are used are imported legally but a little part comes mainly from Senegal through private informal retailers. Farmers usually, purchase pesticides from pesticide vendors in stores or from individuals without store. They travel to local street markets to sell. These pesticides are generally affordable for local population. However, with limited regulation, the quality of substances being sold as pesticides is unknown[9]. Traders do often repackage the pesticides. The use of pesticides has increased significantly in spite of price increases the last five years.

Table 4. Farmer use of pesticides (herbicides, insecticides fungicides) supplied to them by Department of Agriculture (2013-15)

Category	Farmers Utilization of Pesticides		
	Quantity	Domestic Price/liter 2016	Value
Insecticides			
Selective	0		0
Non selective	320 litres	D550	D176.000
Total	320 litres		D176.000
Herbicides			
Selective	111 litres	D550	D61.050
Non selective	95 litres	D550	D52.250
Total	206 litres		D133.300
Fungicides			
Selective	0		0
Non selective	3838 sachets of 10 g	D50	D191.900
Total	3838 sachets		D191.900

Source: Department of Agriculture Bakau

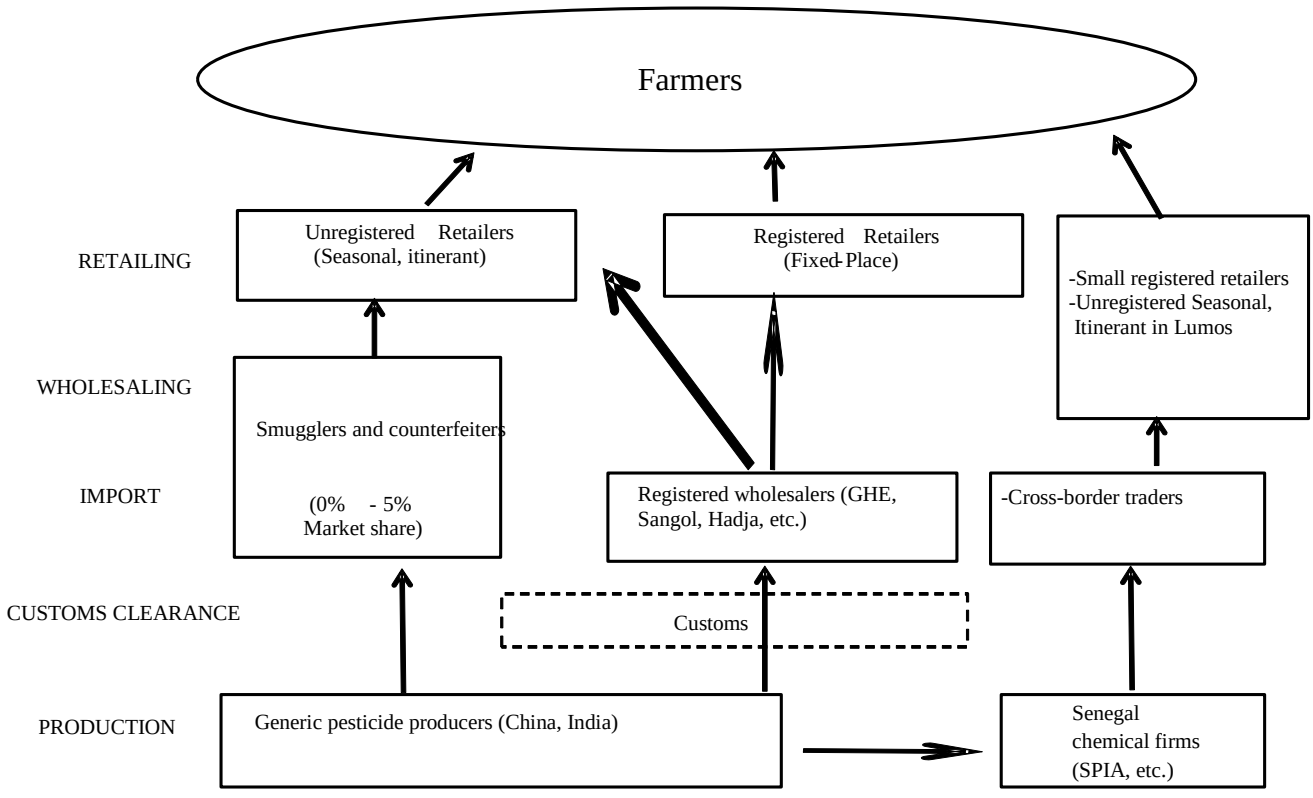
[9] The quality control of pesticides is one of the weak portions of the regulation.

2.3. Supply system

The Gambia relies on pesticides to protect its agricultural production. About 85 percent of the population is involved in agricultural production. Agricultural export revenues derive strictly from the exportation of groundnut and horticulture products (Szmedra, 1994). There is no agrichemical formulation or manufacturing in the country. Pesticides are imported by the private sector and purchased by farming enterprises and individual farmers. In the past, some has arrived as aid-in-kind from Japan and several nations in the European Union. Today, there exists a considerable stock of donated pesticides for which no use currently exists. The Department of Agricultural Services (DAS) of the Ministry of Agriculture governs the import and use of pesticides through the Agricultural Pest Management Unit within the Department of Extension Services. However, government imports account for a small share of pesticide imports. Moreover, these donated pesticides received by the Government are not sold on markets. They are usually distributed when general pest attacks occurs. Disposal of donated though inappropriate pesticides is a recurrent problem (Secka, 2011). Some pesticides enter through illegal channels. There is little information on quantities of pesticides sold through commercial channels or the actual amounts used.

Due to the tiny market, three major companies (GHE, Haja, Sangol) supply the entirety of the national demand for insecticides, fungicides and herbicides. They operate, bringing in pesticides from Senegal or directly from oversea (China, India, etc.). According to Faye (2006), not all imports are controlled because of the low level of control at the Senegalese boundary. In addition to these formally registered firms, a growing array of small firms operate, furnished by the three larger firms cited above. The crop pesticide supply system structure in the Gambia is provided below.

Figure 2. Crop Pesticide Supply System Structure, The Gambia 2016



Among the main pesticide traders in the Gambia, GHE is the largest private distributor of Agrochemicals in the Gambia. He grows and export fresh fruits and vegetables to Europe. There are other small scale importers of pesticides from neighboring Senegal for their own marketing as shown on tables below. Table 5 gives an overview of the major producers, importers and distributors of pesticides.

Table 5. Classification of major producers, importers and distributors

	Number of firms	Key Firms
Local producers	0	None
Major Importers	1	1. Gambia Horticultural Enterprise
Small Importers	2	1. Haja-Latrikunda 2. Sangol Firm
Permanent retailers	10	1. DO-FA Pests 2. Pest Elimination Service 3. Radville Farms 4. Saikou Jabbie 5. Yusupha Nuba 6. Afric-Agro Etc.
Seasonal and Occasional retailers[10]	50	

Around fifty seasonal and occasional retailers operate in the Lumos[11]. Many are itinerant traders, operating in multiple markets by travelling to weekly markets in a given zone on specified weekly market days. The field survey indicates that insecticides are the most widely supplied pesticide and the sales have increased the last five years. Products sold in the Lumos are most of the time unlabeled and come from Kaolack (Senegal).

Figure 3. Some labeled and unlabeled inputs sold on the Farafenni Lumo

These products include mainly insecticides and a few fongicides:

Pesticides in Farafenni Lumo:
Insecticides: Spithoate Bleu – Dimethoate 300EC, sold at D200 per bottle of 250ml; Pacha; Matox-Malathion 500EC, sold at D200/bottle of 250ml; Pachami 50EC-Acetamprid 20g/l

[10] This requires nation-wide survey
[11] Lumos are small weekly markets in the Gambia. For example, Farafenni and Wassu.

sold at D100/bottle of 125ml; Endosulfan 25% Thirame sold at D50/Sachet of 25g; Granox millennium-Imidacloprid 17%; Thiram 10% Carboxin 10% sold at D100/sachet; Mancozeb 80% WP; Sultus 80% WDG; phostoxin;
Fungicides: Caiman Rouge 25%;
Raticides: Ratox-Raticide Cebo-pellet sold at D5/sachet of 20gr;

Figure 4. Insecticides and other inputs on the Farafenni Lumo

Pesticides in Wassu Lumo:
Insecticides: Dimethoate EC 1 liter sold at D450; Dimethoate EC 125ml sold at D80; insecticide powder (home guarder) 30g sold at D30; Final dust (Cypermethrin 20g/K + Chloripyriphos 20g/K) 100g sold at D80; Terminus dust (2.5% d'imidachloropride) 50g sold at D80; Pakala (Lambda 10WP/62.5) 100g sold at D80; Abamectin 18 EC 125ml sold at D80; Carbofuran granules; Methox 90 SP 100g sold at D80.

Figure 5. Insecticides and other inputs on the Wassu Lumo

Among these seasonal sellers interviewed[12], some are registered. The market survey indicate that although they do not have proper shops they are licensed by the Pesticide Management Board and the sales monitored and controlled by inspectors under the national environment agency. The manner of selling was done in the open space with pesticides displayed on the table with other agricultural inputs (fertilizer, seeds, etc.). Most pesticides sold have labels so the vendors know what crops they are being used for. Some pesticides sold are unlabeled plastic bags or containers. Vendors likely mixed multiple pesticides together for resale. As for

[12] Lumos interviews were done by Lamine Diba, Economist at NARI who travelled to Wassu and Farafenni Lumos located in East-Gambia.

knowledge on safety precautions, the survey indicates that vendors are aware of the harmful effects of pesticides and they know the safety precautions associated to dealing with pesticides. Though, through observation they don't have any personal protective gears. Questionable, how the vendors properly mix the pesticides, how farmers apply them and protect themselves and their families during use.

Figure 6. Insecticides sold in unlabeled containers on the Wassu Lumo

2.4. Market trends

The Gambia being a member of the Sahelian Pesticide Committee (CSP) authorizes sale of pesticides registered by CSP. An inventory of pesticides on sale (in Annex 2) was conducted and compared to those on the global list of pesticides authorized by the CSP (version of May, 2016). The result shows that of the 40 different pesticide products found on sale in local markets, 22 were authorized and 18 were on sale but not authorized while an additional 22 pesticides registered by CSP were not on sale in the Gambia. It was found out that 15 and 21 of them are WHO Class II and III respectively.

According to UNEP-GEF (2006), The NEA Database shows on table 6a the quantities of pesticides imported from 1999-2002 are estimated at 1,222.5 tons for solids and 1,581.9 m3 for liquids. These imports involves 20 trade names of insecticides, herbicides and fungicides combined. The NEA database on pesticides includes all categories of pesticides destined for agricultural, public health, research and home use (UNEP-GEF, 2006).

Table 6a: Total Sum of Pesticide Imports by Year Registered at the NEA Inspectorate Database

Year	Pesticides	
	Solid (kg)	Liquid (liter)
1997	249,488	18,925
1998	37,747	361,939
1999	985,089	203,864
2000	33,695	419,315
2001	178,334	693,586
2002	25,365	265,133
Total 1997-2002	1,222,483	1,581,898

Source: UNEP-GEF (2006)

The data on pesticide use/imports from 2003 to 2008 indicates that 6.262 tons of pesticides (insecticides and herbicides) was used in The Gambia. The largest quantity 5.040 tons were insecticides while herbicides 1222 and there was no information on fungicides. The source of these information is the Gambia Bureau of Statistics.

The data on pesticide use/imports 2009 to 2012 indicates that 4,849 tons of pesticides (insecticides, herbicides and rodenticides) was used in The Gambia. According to The Gambia Bureau of Statistics, the largest quantity 4, 442 tons were insecticides, herbicides 22 tons and there was no information on fungicides. Note that these data include agricultural pesticides as well as anti-malarial insecticides and other pesticides used for public health purposes.

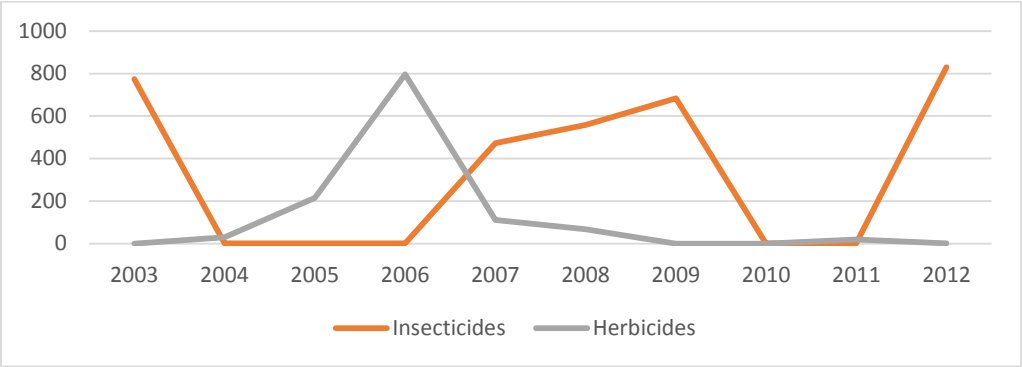
A joint (Senegal-Gambia) border survey would be essential to ascertain more details about the type of agricultural insecticides and herbicides and fungicides currently in use.

Table 6b: Trends in volume of Pesticides imports (in tons) in The Gambia (2003 - 2008)

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total (2003-08)	Total (2009-12)
Insecticides	774	1,092	1,123	1,019	473	559	683	1,617	1,313	829	5040	4442
Herbicides	0	30	215	797	112	68	0	0	20	2	1222	22
Total	774	1122	1338	1816	585	627	1018	1632	1382	847	6262	4849

Source: National Environment Agency

Figure 7: Trends in volume of Pesticides imports (in tons) in The Gambia (2003 - 2012)



The data from the Department of Agriculture indicates that insecticides are more widely used. The total amount of insecticides captured by the stores office is 320 liters valued at D5,440,000 during the period (2013-2015). They are all private sector distributed pesticides. According to the interviews, the use of chemical pesticides has increased in the Gambia with expanding vegetables production and exports over the years as well as increasing domestic vegetables consumption. This trend has been observed since 2012. The levels of insect infestations also directly affect insecticide use (Szmedra, 1994). Data about pesticide use are weak and the market for pesticides in The Gambia is thin. There is a limitted record on market for pesticides, including products illegally imported and sold without moving through proper pesticide registration channels.

The Ministry of Agriculture (MOA) who receives pesticide donations intermittently, is also considered as an importer and user of pesticides. The pesticides owned by MOA are not for sale on the markets but usually used for locust control and other general attacks. The MOA has not imported pesticides or received donations in 2002 (KR2, Japanese Grant). In fact, the Ministry has not imported or received pesticide donation under the KR2 grant program since 1991.

Price trend

There is limited data on price of pesticides and the difference between that of importers and retailers largely depends on growing season of the target crop. There are better prices in rainy season for most pesticides especially herbicides. The data on import price of pesticides was available from only two firms GHE and Haja Latri-Kunda, the later imports mainly from Senegal and there is little difference in yearly import price. The import price for insecticides per liter for example in 2009 is D450.00 where as in 2016 D500.00. There is a difference of D50.00 after 5 years.

Table 7a: Import Price of Pesticides (Gambia Horticulture Enterprise-in $ per liter or kg)

Pesticide Category	2014	2015	2016
Insecticides	$12	$14	$15
Herbicides	$8	$9	$9
Rodenticides	$3	$3	$3

Table 7b. Import Price of Pesticides into the Gambia (Haja Latri-Kunda -in Dalasi per liter or kg)

Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Insecticides	D450	D450	D450	D450	D500	D500	D500	D500
Herbicides	D350	D350	D350	D350	D400	D400	D400	D400
Fungicides	D375	D375	D375	D375	D400	D400	D400	D400

The market in The Gambia has apparently insignificant large scale distributors and no manufacturing of pesticides. The data on domestic market price of pesticides from two key distributors (GHE, Haja and Sangol), show little difference in yearly domestic price. The domestic price for insecticides per liter for example in 2009 is D500.00 where as in 2016 D550.00. There is a difference of D50.00 after 5 years.

Table 8a: Domestic Market Price of Pesticides (G.H.E-in $ per liter or kg)

Year	**2014**	**2015**	**2016**
Insecticides	$15	$16	$17
Herbicides	$10	$11	$11
Rodenticides	$4	$4	$4

Table 8b. Domestic Market Price of pesticides into the Gambia (Haja Latri-Kunda -in Dalasi per liter or kg)

Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Insecticides (Abamectin, Deltamethrin, Dimethoate etc.)	D500	D500	D500	D500	D550	D550	D550	D550
Herbicides (Stomp, propanil etc.)	D450	D450	D450	D500	D500	D500	D500	D550
Fungicides	D450	D450	D450	D440	D500	D500	D500	D500

Glyphosate Inventory and Timetable of Glyphosate brands registered for sale locally

The use of glyphosate in The Gambia is insignificant and from the inventory only 5 types are on sale at the dealers visited: 3 registered by CSP, 1 not registered and 1 registered to a firm other than the manufacturer or distributor selling it (Table 9).

Table 9. Inventory of Glyphosate registered and unregistered products sold in local markets

Product Name	Distributor	Location	Manufacturer	Production Site	Registration
1. Rival 360 SL	Haja	Latrikunda	SEMBIOS	Not on label	CSP 2016
2. Roundup 360 K	Haja	Latrikunda	MONSANTO	Not on label	CSP 2016
3. Glyphosates 41 SL	G.H.E	Kanifing	YUFULL	Not on label	Registered
4. Kalach	Sangol Farm	Bakau	YUFULL	Not on label	Registered by Arysta
5. Glyphosate 360	Saikou Jabbie	Brikama	YUFULL	Not on label	Not registered

Source: Market visits

3. REGIONAL PESTICIDE POLICIES

3.1. CILSS regional policies

3.1.1. CILSS pesticide regulations, 1992

Because pests such as grasshoppers, locusts and grain-eating birds move rapidly across national borders, Sahelian countries have long recognized the importance of a common regional response to pest attacks. Indeed, colonial and post-colonial regional groupings, such as the Organisation commune de lutte antiacridienne et de lutte antiaviaire[13] (OCLALAV), founded in 1965, and the Organisation inter-état de controle des criquets migratoire en Afrique (OICMA), founded in 1952, were established to monitor and coordinate responses to pest outbreaks. While OICMA continues to function, organizational difficulties and precarious finances led to the dissolution of OCLALAV in 1986.

In the Sahel, a series of major pest invasions arriving in the wake of the Sahelian droughts of the mid-1970 motivated strong interest in regional pest control programs and pesticide regulation. CILSS, formed in 1973 formed to combat the drought, offered a new institutional vehicle for coordinating a regional response to the ensuing pest attacks. To manage Sahel-wide pest responses, donors selected CILSS over other existing institutions for a number of reasons: • disappointing performance by existing post-colonial regional technical groupings such as OCLALAV and OICMA; • heavy prior reliance on toxic insecticides in the face of new preferences for a more integrated approach to pest management; • desire to focus resources on the Sahel which they viewed as the most vulnerable area and in greatest need (OTA, 1990).

As the droughts came to a close in the late 1970s, USAID funded a regional integrated pest management (IPM) project implemented through the CILSS agency, the Institut du Sahel (INSAH) from 1980 to 1987. In order to institutionalize an ongoing implementation capacity following termination of the project funding, CILSS established a new unit within INSAH, called the Unité de Coordination Technique Régionale en Protection des Végétaux (UCTR-PV), charged with preparation of regional regulations governing pesticides and crop protection measures.

The UCTR-PV, thus, became the initial operational agency managing regional pesticide regulations within the CILSS member countries. In 1991, the UCTR-PV, aided by external consultants, prepared two draft regional regulations for consideration by the CILSS member countries: one governing registration (homologation) of pesticides and the other governing phytosanitary controls.

In April of 1992, the CILSS Council of Ministers of Agriculture formally adopted both sets of regulations at their 27th ministerial meeting in Ouagadougou (Table 10). To implement these regulations, the ministerial resolution called on the CILSS Executive Secretary to design implementation modalities and source funding for regional regulatory operations.

[13] OCLALAV grouped together 10 West African francophone countries : Bénin, Burkina Faso, Cameroun, Côte d'Ivoire, Gambie, Mali, Mauritanie, Niger, Sénégal et Tchad.

Table 10. Policy chronology of the CILSS regional pesticide regulations

Policy actions	**Legal texts**	**Comments**
	1992 CILSS common regulations on pesticide regulation	
		• CILSS technical workshop elaborates draft regulations (1991)
Pesticide regulations adopted by the CILSS Council of Ministers of Agriculture (27th session, Ouagadougou, April 7, 1992).	Resolution N° 7/27/CM/92 of the CILSS Council of Ministers of Agriculture	
Comité Sahélien des Pesticides (CSP) established as the CILSS regional regulatory review body (1994)	Resolution N° 10/29/CM/94 concerning the application of regional pesticide regulations adopted by the 29th session of the CILSS Council of Ministers of Agriculture (Praia, Cape Verde, April 18 and 19, 1994)	• CSP based at Institut du Sahel (INSAH) in Bamako • staffing includes only the coordinator of UCTR-PV • First CSP meeting held to evaluate pesticides proposed for registration (homologation), March 1994.
	Failed legal "domestication" by national parliaments	
Country ratification of the regional regulations	• Niger (Ordonnance 96-008) • Gambia (draft legislation prepared, 1998)	• Despite approval of a CILSS-compliant national pesticide law, some of Niger's implementing instruments fail to comply fully with CILSS packaging and labelling requirements. • Gambia prepares draft legislation. CSP advises them to wait for new, revised regulations. • Multiple countries issue executive regulatory orders recognizing CSP but without revising laws to make legal framework CILSS-compliant (Burkina, Chad, Gambia, Guinea Bissau, Mali, Niger).
	1999 Revised CILSS pesticide regulations	
CILSS establishes Permanent Secretariat of the CSP to improve its functioning		• FAO launches Project GCP/RAF/335/NET: "Implementation of the interational code of conduct on pesticide utilization in the Sahel region"(1998 à 2003) • CILSS requests help from the FAO for joint review of the pesticide regulations (1998)
Adoption of revised CILSS pesticide regulations (December 16, 1999)	Resolution N° 8/34/CM/99 adopted by the CILSS Council of Ministers of Agriculture	
National ratification of the	**1) Mali** : Instrument de	• CSP, with FAO support, follows

CILSS pesticide regulations by the parliaments of CILSS member states (1999 to 2005)	ratification du 13 novembre 2001 : Loi n°01– 102 / P-RM du 30 Novembre 2001, portant ratification de l'Ordonnance n°01–046 / P-RM du 20 Septembre 2001 autorisant la ratification de la Réglementation commune aux Etats membres du CILSS Loi N° 02/014 du 3 juin 2002 instituant l´homologation et le contrôle des pesticides en République du Mali Décret n° 09-313/P-RM du 19 juin 2009 fixant les modalités d'application de la loi 02/014 **2) Senegal :** Loi n° 2002-28 du 9 décembre 2002 autorisant le Président de la République à ratifier la version révisée de l'Accord portant Réglementation commune aux Etats membres du CILSS **3) Mauritania** : Loi 2003-027 autorisant le Président de la République à ratifier la Réglementation commune…, du 20 juillet 2003 **4) Chad** : Instrument de ratification 03 Novembre 2003 **5) Gambia** : Instrument of ratification 19 November 2003 **6) Burkina Faso** : Instrument de ratification 2004-016/MAE-CR/SG/DAJC/STAI, du 20 juillet 2004 **7) Niger** : Déclaration de ratification de la Réglementation commune, du 29 juillet 2004 **8) Cape Verde**: Lettres de ratification de la Règlementation Commune 18 juillet 2005	up with individual countries to promote ratification of the CILSS common regulations • To date, only Guinea Bissau has failed to ratify the CILSS common regulations • In May 2016, CSP held its 38th regular session in Bamako. • CSP posts a list of all registered pesticides on the INSAH website

The CILSS secretariat implemented the first of these mandates in 1994 when it established the Comité Sahélien des Pesticides (CSP), a new regional regulatory body designed to review applications from pesticide companies for the right to sell specific pesticides throughout the 9-country region.[14] CILSS designers created the CSP as a one-stop-shop for companies wishing to sell pesticides in any of the member countries. Under the enabling legislation, any pesticide reviewed and approved (homologated) by the CSP can be legally sold in all member countries.

The CILSS ministerial resolution creating the CSP charged the new body with the following key functions:

- Review and vet all pesticide products proposed for registration (homologation) and sale with the region
- Establish a list of public units authorized to conduct efficacy trials
- Establish a list of laboratories authorized to conduct expert analysis
- Define methods for verifying the composition and quality of pesticide products as well as their impact on human health, animal health and the environment
- Specify data and tests required by firms submitting pesticides for regulatory review
- Maintain a registry of all registered (homologated) and provisionally authorized pesticides[15]
- Inventory pesticide products sold within the CILSS member countries
- Maintain a list of dangerous and banned pesticides
- Liaise with all member country national pesticide committees (CNGP)

Membership in the CSP includes three categories of participants. Regular members include two experts from each member state, three toxicologists working in the Sahel and the Permanent Secretary of the CSP. Non-voting associate members include the Technical Director of OCLALAV as well as one representative from ECOWAS, CPI/OUA, and AGRHYMET. In addition, the CSP invites observers from technical specialist agencies such as the FAO, WHO and the Comité Phytopharmaceutique de la zone humide de l'Afrique de l'Ouest et du Centre (CPZHAOC). Financing for the CSP comes from multiple sources, including CILSS, its member states, donors and fees charged to submissioners.

In March 1994, the newly constituted Comité Sahelian de Pesticides (CSP) met for the first time. At their first meeting, the CSP reviewed 98 requests for regulatory approval that pesticide firms had filed previously with the UCTR-PV. Among these, the CSP considered 68 submissions incomplete. After reviewing the 30 remaining files, the CSP issued one provisional authorization (APV) to sell an anti-acridien insecticide marketed under the tradename DIMILIN OF-6. Five others products received provisional approval, conditional on supplying a reference sample. By 1998, the CSP had met eight times and reviewed over 240 pesticides applications (Abiola et al. 2004).

The CSP operates under operating rules (règlement intérieur, or RI), signed by the Executive Secretary of CILSS. According to these operating rules, the members designate one of their

[14] However, CILSS did not implement the second set of regulations, on regional phytosanitary controls, reportedly due to financial constraints (CILSS 1997).
[15] For a current online listing of registered pesticides, see http://196.200.57.138/dbinsah/index.cfm?sect1=pesticide&id=58

members to preside over CSP sessions over a four-year period. Under these rules, Mr. Gnissa Konaté, representative of Burkina Faso, presided over the November 2016 CSP meeting.

3.1.2. Failed national "domestication"

Under the CILSS treaty, collective decisions of the Council of Ministers and regional regulatory bodies require ratification by national parliaments as well as issuance of conforming national regulations before they become applicable within the member countries.[16] Despite this legal "domestication" requirement, by 1998 only Niger had formally adopted the 1992 CILSS pesticide regulations into national law (Pardo-Leal 1999).[17]

Our interviews suggest two sets of constraints may have limited formal action by national parliaments. The first concerned the limited resources and staffing at the UCTR-PV, the unit that served as the Permanent Secretariat for the CSP between 1994 and 1998. With a single staff member, the UCTR-PV did not have the necessary resources to monitor and motivate 9 member parliaments. Working instead through consultants proved difficult, given sensitivities about formal protocols for modifying parliamentary calendars. A second set of difficulties revolved around ambiguities and inconsistencies in the initial regulations, which had been formulated by technicians rather than by trained lawyers.

In spite of parliamentary failure to enact formal national enabling legislation in eight of the nine CILSS member countries, the national technical agencies responsible for pesticide monitoring in practice participated in the CSP review process and generally accepted CSP pesticide registration decisions. As early as 1994, CILSS member countries have participated in CSP deliberations and honored CSP registration decisions. In fact, executive regulatory orders issued or under review by the relevant national authorities in Burkina, Chad, Gambia, Guinea Bissau, Mali and Niger referred specifically to the CILSS pesticide regulations or to the CSP (Pardo-Léal 1999). For example, Mali's Décret No.95-404 stated, "L'homologation des produits agropharmaceutiques se fait conformément à la Réglementation commune aux Etats membres do Comité Inter-etat de Lutte contre la Sécheresse et la Désertification (CILSS)." Burkina Faso's Décret No.98/472 similarly mandated that, "La Commission Nationale des Pesticides est chargée … du suivi et de l'évaluation des résolutions et recommandations du Comité Sahélien des Pesticides."

Despite de facto acceptance of CSP pesticide registration decisions, the umbrella legislation in all countries but Niger failed to comply with the CILSS regional regulations.[18] Because the umbrella laws under which these executive actions were issued did not fully conform to

[16]Unlike CILSS, the ECOWAS treaty stipulates that regional regulations adopted by ECOWAS agencies automatically assume legal force throughout the 15 ECOWAS member countries (Keyser et al. 2015). However, there are divergent views including the view that some member country constitutions, such as Ghana and Nigeria, secure national sovereignty and thereby dictates that national regulations take precedence over ECOWAS regional regulations until the domestication of such regulations. This means that ECOWAS regulations on their own are subordinate to national laws and regulations. Under this states-rights interpretation, ECOWAS member countries, like CILSS member countries, would need to pass national legislation and regulations formally adoptioning the ECOWAS regional pesticide regulations in order for them to take full legal force within a specific country. To our knowledge, no one has litigated this question.

[17] Note that Gambia's parliament had also drafted CILSS-compliant legislation which they had under active review in 1998. The CSP, however, requested that the Gambians wait for revised regional regulations in order to avoid having to approve the CILSS regulations twice (Pardo-Leal 1999).

[18] Niger's1996 umbrella law on pesticide products (Ordonnance 96-008 of 21 March 1996) did explicitly recognize the CSP and the CILSS regional pesticide regulations. However, implementing instruments failed to comply fully with CILSS labelling and packaging regulations (Pardo-Leal 1999).

CILSS regional regulations, a legal ambiguity arose as to the enforceability of these executive orders. In order to convert tacit technical support for the CSP into a fully enforceable legal framework, the CILSS member states turned to the FAO for help in regularizing the legal framework governing pesticide regulation in the member countries.

3.1.3. Revised CILSS regulations, 1999

Concerned about slow national ratification of the 1992 regional pesticide regulations, the CILSS secretariat requested assistance from the FAO to help accelerate full legal enactment of the CILSS regional pesticide regulations (Table 1). Under a five-year project entitled "Mise en oeuvre du Code international de conduite sur la distribution et l'utilisation des pesticides dans les pays sélectionnés de la région du Sahel" (GCP/RAF/335/NET), the FAO supported CILSS as well as national-level agencies involved in implementing the CILSS regional pesticide regulations. Centered on the CSP, project efforts supported the establishment of a permanent secretariat for the CSP, based at INSAH. In addition, the project assisted national governments to reinforce their capacity to assess and monitor the distribution and use of pesticides. The UCTR-PV, which had served as secretariat for the CSP from 1994 through 1998, gave way to the new permanent secretariat to the CSP. The CSP permanent secretariat became operational with the start of the FAO project**.**

The FAO project team and local partners at CSP reviewed the 1992 regulations and proposed a revised set of regional regulations (Pardo-Leal 1999). Though they did not alter the content of the original 1992 CILSS regulations significantly, the 1999 revisions addressed several gaps and inconsistencies revealed by the four years of well-intended but largely uncoordinated national legislative and regulatory compliance efforts.

In the end, the content of the 1999 regulations differed from the 1992 regulations in five primary ways:

• *Ratification requirements.* The 1992 legislation required ratification by all 9 member countries before the regional regulations would become operational anywhere (1992, Article 25). This technically held all member countries hostage to a single delinquent parliament. Given ongoing political unrest in Guinea Bissau, the prospect of new enabling legislation from 100% of member states seemed remote. The revised regulations, issued in 1999, solved this problem by stipulating that approval by five members states (a majority) would make the CILSS regulations operational throughout the CILSS region (1999 Article 35).

• *Retro-active legalization of CSP homologation decisions from 1994-1998.* Given the failure of all national parliaments to approve 1992 CILSS regulations, all 240 review decisions made by the CSP between 1994 and 1998 were technically without legal foundation. In order to remedy this anomaly, the 1999 CILSS regulations explicitly make the accumulated CSP decisions through 1998 approve retroactive under new (1999 Article 36).

• *Standardized renewal periods.* The 1992 rules included ambiguous language concerning the number of allowed registration renewals. The 1999 common regulations stipulate that the CSP can award provisional approvals (autorisation provisoire de vente, APV) for a three-year period, renewable only once. Full homologation, however, remains valid for a period of five years, renewable thereafter for the same period. • *Appeals.* The 1992 regulations made no provision for appeals of CSP regulatory decisions. At the suggestion of the CSP secretariat, the 1999 regulations outline a process by which a rejected file could file an appeal (1999 Article 29).

• *Common terminology and definitions.* Country-level efforts to integrate the 1992 CILSS regulations into national law resulted in a welter of differing terminology. Individual

countries and statutory instruments referred variously to "pesticides" (Burkina, Gambia, Senegal, Chad), "phytosanitary products" (Cape Verde), agro-pharmaceuticals (Mali, Senegal) and "phyto-pharmaceuticals" (Guinea Bissau). With FAO support for national drafting committees, the 1999 regulations and the enabling national legislation standardized in using the term "pesticide" along with the official definition as stated in the FAO International Code of Conduct (1999 Article 2).

In 1999, the CILSS Council of Ministers of Agriculture formally adopted the revised regional pesticide regulations via Resolution No. 8/34/CM/99. With follow-up support from the permanent CSP secretariat and the FAO, member country parliaments gradually introduced national legislation formally adopting the regional regulations and establishing the national regulatory structures required to implement the CILSS regional pesticide regulations. Mali's parliament became the first to adopt legislation implementing the regional regulations in November 2001. The 1999 CILSS pesticide regulations and regional regulatory body become legally functional in 2003, after Gambia became the fifth member state to formally ratify them. By 2005, Cape Verde became the eighth of the nine original CILSS member countries to pass national legislation and regulations explicitly adopting the CILSS regulations and the CSP as a common regional regulator (Table 1).[19]

CILSS membership expanded in 2011 when four coastal francophone countries of Benin, Côte d'Ivoire, Guinea and Togo formally joined. At that point, the CILSS regional pesticide regulations and regulatory structures became available to the newcomers. Nonetheless, none of the four has adopted conforming national legislation. Nor have any of the four newcomers submitted any pesticide dossiers to the CSP for review. Instead, they have each continued to regulate pesticides through their pre-existing national pesticide committees.[20] However, since 2013 they have attended the bi-annual CSP meetings as observers. Since all four CILSS newcomers are also members of the broader ECOWAS grouping, the 2008 ECOWAS regional regulations on pesticides also apply to them. As with the CILSS regulations, however, the ECOWAS pesticide regulations are not yet operational in these four countries or indeed in any ECOWAS country outside of the Sahel (for example, Ghana and Nigeria). In order to speed up implementation of the ECOWAS pesticide regulations, ECOWAS has commissioned the CILSS CSP to help launch a parallel regional review body serving the coastal ECOWAS member states. The CSP will continue, as it has since 1994, to regulate pesticides for the Sahelian members of ECOWAS.

By convention, the CSP schedules ordinary meetings twice annually. Over time, homologation decisions in any given year have trended generally upwards, with particularly rapid increase in herbicide submissions over the past decade as well as a few new insecticides, primarily for horticultural products, (Table 11). In May 2016, the CSP held its 38th ordinary meeting at INSAH headquarters in Bamako. As of that time, the CSP has authorized 205

[19] Due to ongoing political turmoil, Guinea Bissau remains the only original CILSS member not to have ratified the 1999 CILSS regional pesticide regulations.

[20] Three of these four countries (Benin, Cote d'Ivoire and Guinea), together with Ghana, received support under a five-year French-financed project to help organize national pesticide regulations. The HIP project (including Benin, Côte d'Ivoire, Ghana, and Guinea), began in 1993 and ended in 1999, financed by the French ministry of cooperation. At the end of the project, in 1999, each country continued to regulate pesticides through its national phytosanitary committee. Unlike the CSP, whose member countries agreed to institute common regulatory review, the HIP strategy involved harmonization of the national regulations (same registration forms are used) but it relied on independent national regulatory review and enforcement processes.

pesticide products for sale, including 126 herbicides, 67 insecticides, and 12 fungicides (CSP 2016).

Table 11. Trends in the number of pesticides* authorized for sale each year by the Comité Sahelien des Pesticides (CSP)

Pesticides categories	1995	2000	2005	2010	2015
Herbicides	0	9	6	25	49
Insecticides	4	9	3	16	16
Fongicides	0	1	1	3	4
Total	4	19	10	44	69

* List includes products applicable to all crops as well as selective products used on cotton, maize and rice.
Source : CSP "Listes des pesticides autorisés", various years.

3.2. Implementation requirements for member countries

The regional CSP pesticide review process forms the centerpiece around which national implementing agencies operate. The CSP regulatory review, in turn, revolves around formal review and registration (homologation) decisions. Under CSP procedures, regulatory approval occurs in two stages. First-time CSP approval for any given pesticide results in the granting of a Provisional Sales Authorization (Autorisation Provisoire de Vente, or APV) for that specific product. The APV remains in force for a three year trial period during which CSP may require collection of complementary data necessary for a final approval. In the absence of any new negative information, the CSP typically grants an automatic 3-year extension of the APV. Final regulatory approval comes in the form of a registration (homologation) number valid for a period of five years and renewable thereafter.

National agencies play key roles before, during and after CSP review. The CILSS regional pesticide regulations partition responsibilities among regional and national agencies as described in Table 12. In general, the CSP focuses on the joint regulatory review and formal authorization (homologation) of pesticides proposed for sale within the region. At the national level, regulatory bodies play key roles prior to the CSP registration, during and afterwards.

Prior to the CSP regulatory review, national regulatory bodies contribute by conducting required tests of the product's biological efficacy and human toxicity. These findings form a key part of the dossier presented by private firms requesting product registration. During the CSP deliberations, each member country supplies two members to participate in the CSP deliberations and decision-making. Then, following regional regulatory approval by the CSP, national structures intervene once again to regulate and license distributors, monitor local markets, ensure product quality and safety, monitor on-farm use and conduct impact studies on human and environmental health.

Table 12. Regulatory responsibilities of member countries in implementing CILSS regional pesticide regulations

Regulatory stages	Responsibility	
	Regional	National
Pre-homologation	• establish a list of establishments authorized to conduct trials and tests • define testing methods • specify data and tests required for regulatory review	• conduct field trials and tests of product efficacy • conduct laboratory tests of product toxicity
Registration (homologation)	• CSP review and decision	• participate in CSP deliberations, twice annually
Post-homologation	• maintain registry of all authorized pesticides • maintain list of banned pesticides • liaise with country national pesticide committees	• license distributors • monitor products sold on local markets • confiscate and dispose of counterfeit, unregistered or outdated pesticides • promote awareness of existing regulations and safety issues • provide training and information on proper pesticide use

4. IMPLEMENTATION OF REGIONAL PESTICIDE REGULATIONS IN THE GAMBIA

According to Secka (2011), the management of pesticides in the Gambia dated back in the colonial area with the advent of Acts promulgated in 1936 and 1962 targeting the most important cash crop groundnut. These acts were implemented by the Gambia Products Marketing Board, the Department of Agriculture and the Department of Cooperative with a view to protect groundnut from pests to enhance marketing of the oil. As stated by Unitar (2003), the use and management of chemicals (mainly pesticides) were regulated through two main Acts prior to the enactment of the Hazardous Chemicals and Pesticides Control Management Act of 1994 (HCPCMA): the 1935 Public Health Act and the Pesticides Control and Management Act of 1983. They were the only legal instruments available against negative effects of toxic and hazardous chemicals to humans and the environment (Unitar, 2003).

The Chemical and Pesticides Control Management Board established by the HCPCM Act is the primary authority with legal mandate to enforce the provisions of the HCPCM Act.[21] The Chemical and Pesticides Control Management Board has 6 primary responsibilities. They are:

i. monitor and control the import, manufacture, distribution storage, and disposal of chemicals and pesticides in The Gambia and to this end collect, maintain and publish information relating thereto;[22]
ii. prepare guidelines on the environmentally sound handling and use of chemicals and pesticides;[23]
iii. conduct public educational campaigns on the wise use of chemicals and pesticides;[24]
iv. register pesticides, issue provisional clearances certificates and permits;[25]
v. control the import, manufacture, sale, storage, and use of chemicals and pesticides through licensing;[26]
vi. designate by order published in the Gazette any chemical to be a hazardous chemical which shall be subject to the provisions of this Act and the regulations, and register and issue provisional clearance and certificates for such chemicals'[27]

The HCPCM Act lists the composition of the Board,[28] and it includes the Executive Director of the National Environment Agency who serves as Chairman of the Board. By stipulation of the Act, the Board must meet a minimum of 4 times a year. The Board is the legal authority responsible for considering applications for the registration of chemicals or pesticides; renewal of registered chemicals or pesticides etc.[29] We found that the National Environment Agency is considered the secretariat of the Board as several of the provisions of the Act pertinent to pesticide registration, renewals of registration etc. are coordinated by the NEA.

[21] S.3(1) HCPCM Act 1994 (as amended)
[22] S. 3(2)(a) HCPCM Act 1994 (as amended)
[23] S. 3(2)(b) HCPCM Act 1994 (as amended)
[24] S. 3(2)(c) HCPCM Act 1994 (as amended)
[25] S. 3(2)(d) HCPCM Act 1994 (as amended)
[26] S. 3(2)(e) HCPCM Act 1994 (as amended)
[27] S. 3(2)(f) HCPCM Act 1994 (as amended)
[28] S.4 HCPCM Act 1994 (as amended)
[29] S. 14(2) HCPCM Act 1994 (as amended)

The Act calls for the mandatory registration of all hazardous chemicals (including pesticides), and provides a wide and comprehensive framework for the control and management of their manufacture, distribution and use (Secka, 2011). However, since the adherence of The Gambia to the common CILSS regulations system for pesticide registration, the Gambia relegated the responsibility of registration of pesticides to the Sahelian Pesticide Committee (CSP) in 2003. National research and regulatory bodies are in charge of pre-registration and post-registration activities. The Gambia sits on this registration committee.

4.1. The Gambia's legal framework governing pesticides

Currently, the legal and regulatory instruments in force in the Gambia relative to chemicals and pesticides management, and environmental protection and management are as follows:
• The National Environmental Management Act 1994. It is not specific to hazardous chemical or pesticides but covers all environmentally related issues (.
• The Hazardous Chemicals and Pesticides Control and Management Act 1994 (HCPMCA)
• The Hazardous Chemicals Regulations 1996.
• The 2003 Supplementary Regulations for Pesticide Regulation and Licensing including the CILSS Common Pesticides Regulation were also incorporated.

The institutions involved in the use of pesticides are largely public, depending on the problem areas such agricultural pesticides for crop protection, malaria control pesticides for mosquito control. However, these institutions do not have full control on pesticides. The Executive Director of NEA, provided with his mandate made in the HCPMCA, has established an institutional framework for the management of chemicals and pesticides, with the following structures: • appointed a Multi-Sectoral Board for the administration of the Act, • appointed the Registrar of Chemicals and Pesticides to manage the Pesticides • field Inspectorate, • appointed Pesticide Inspectors from collaborating national institutions for the enforcement of the Act, and • established a Pesticide Formulation Laboratory to test pesticides and chemicals imported in the Gambia (Unitar, 2003). Table 13 below details the legal chronology governing pesticide regulations in the Gambia over the past five decades.

Table 13. The Gambia Policy Chronology

Policy actions	**Legal tests**	**Comments**
	Pre-Independence Acts	
Ordained by Colonial Masters	- The Plant Importation Act 1936 - The Prevention of Damage by Pests Act 1962 - The Groundnut Standard of Quality Act	- To prevent introduction of exotic pests - To reduce post-harvests and storage pests in ground to enhance its export marketing - Improve groundnut by controlling pests using recommended pesticides though dangerous such as Lindaine, Aldrin, and prevent adulteration of produce**.** The main export company was Gambia Produce

		Marketing Board (GPMB)
	1992 CILSS common regulations on pesticides	
Pesticide regulations adopted by the CILSS Council of Ministers of Agriculture (27 session Ouagadougou)	Resolution N0 7/27/CM/92 of CILSS Council of Ministers of Agriculture	The Gambia is member
Regional Regulatory review body, the Sahelian Pesticides Committee (CSP), established in 1994	Resolution No 10/29/CM/94 concerning the application of regional pesticide regulations adopted by the 29th session of the Council of Ministers of Agriculture (Praia, Cape Verde, April 18 and 19, 1994)	• CSP based at Institute du Sahel (INSAH) in Bamako • CSP meets twice annually • In May 2016, CSP held its 38th regular session in Bamako. • CSP posts the list of all registered pesticides on the INSAH website.
	National ratification of CILSS common regulations	
Gambia fails to ratify CILSS 7/27/CM/92		• few countries ratify initial regulations • CILSS requests help from the FAO (1998)
	National Environment Agency Legislative Frame-work	
Environmental Laws and regulations of The Gambia created the National Environment Agency (NEA) Custodian and lead implementing body	Hazardous Chemicals and Pesticides Control and Management Act, 1994 (HCPCM)	Mandatory Registration of chemicals and pesticides. The Pesticide Management Board created (multi-sectorial body)
-Pesticides Registration -Pesticide Licensing -Pesticides Administration	The Pesticide Regulations, 1994	From HCPCM Act, 1994 Registrar of pesticides appointed under NEA
	1999 Revised CILSS pesticide regulations	
Adoption of the revised CILSS pesticide regulations (December 16, 1999)		

	National ratification of CILSS regional regulations	
Ratification of the CILSS pesticide regulations by the parliaments of CILSS member states		Gambia ratifies CILSS pesticide regulations, November 2003 Registration of pesticides is no longer performed nationally but by CSP/CILSS
	ECOWAS regional pesticide regulations	
		The process of adoption of Harmonization of the use of agrochemicals have begun in the Gambia. A draft legal frame work for ratification prepared and submitted to the Ministry of Agriculture in 2016. The process was supported by WAAPP Project
	Recent Acts and Conventions the Gambia ratified	
Purposes are to strengthen institutions involve in Food and Nutrition Security	- The Food Act 2005 - The Food Safety and Quality Act - International Plant Protection Convention 2016 - Rotterdam Convention - Stockholm	- Mainly to prevent or minimize mal-nutrition in lactating mothers and children and maintain quality of agriculture value chain. - Enhance market access for agricultural produce limit contaminant, toxins and pesticide residues - Dangerous Pesticides though importation not prohibited but there must be prior consent - PoPs dangerous chemicals and pesticides

4.2. Implementation of the regional pesticide regulation

4.2.1. Prior to the CILSS regional pesticide regulations

There was no pesticide registry system was in place in the Gambia before CILSS adopted a framework for common regional pesticide regulation in 1992. There were only materials on the Ministry of Agriculture imports but no official records were maintained. With the assistance of FAO and in an attempt to control the distribution and use of pesticides, the government has revised the Pesticide Control and Management Act of 1983 and has established a pesticide registration scheme. The 1983 act which lacked regulations and guidelines, was indeed not implemented. The revised act is known as the Hazardous Chemicals and Pesticides Control and Management Act (HCPCM Act) enacted in 1994. The FAO provided legal, registration, and chemistry expertise. A set of Regulations entitled "The pesticides registration and licensing regulations" were drafted in order to incorporate the CILSS common regulations, into the HCPCM Act of The Gambia. These regulations seek to adopt the CILSS common regulation procedure and make them applicable in The Gambia. In 1996, the HCPCM Act was amended by repealing the 1994 schedule and replaced by a new schedule prescribing fees for applications, licenses, registration and other fees for the importation of pesticides.[30] It would seem that the focus here was to strengthen regulation on fees relating to applications made pursuant to the Act. Besides this amendment, there are no further records of any amendment to the Law. Thus, the opinion is that Gambia has yet to legally incorporate the CILSS common regulation.

4.2.2. Changes in response to the CILSS regional pesticide regulations of 1992

Following the launch of the Comité Sahélien des Pesticides (CSP) in 1994 and the adhesion of The Gambia to the common regulation in 2003, the Gambia relegates the responsibility of registration of pesticides to the Sahelian Pesticide Committee. There is no specific "Comité National de Gestion des Pesticides (CNGP)" holding responsibility for monitoring national implementation of CSP decisions. Domestically, NEA is mandated to monitor these chemicals and collaborates with other institutions. But there is no regulation on the creation of a CNGP. NEA is responsible for all chemicals including pesticides.

The Gambia sits on the CSP registration committee. National implementation of the CSP pesticide regulations is under the umbrella of NEA (through the Office of Registrar of Pesticides and Chemicals and the HCPCM Board) exclusively responsible for sound monitoring of environmental measures during importation, handling, storage, use and disposal of all pesticides and chemicals.

The NEA operates under the Department of State for Fisheries, Natural Resources and the Environment. The Hazardous Chemicals and Pesticide Control and Management Act (1994), mandates it to control the use of chemicals and pesticides in the Gambia. This Act established the Hazardous Chemicals and Pesticide Management Board and appointed a Registrar of Pesticides and Chemicals. The board has been established by an Act. It meets once every

[30] See Hazardous Chemicals and Pesticides Control and Management Act (Replacement of Schedule) Order, 1996 (L. N. No. 38 of 1996).

two months but the Secretary can call an emergency meeting. The Board has representatives from the following Institutions (Unitar, 2003):[31]

(i) NEA (Chairperson and Secretariat of Board)
(ii) Department of Agricultural Services (DAS)
(iii) Department of Livestock Services (DLS)
(iv) National Agricultural Research Institute (NARI)
(v) Department of Health Services
(vi) Attorney General's Chambers
(vii) Gambia Chamber of Commerce
(viii) Customs and Excise Department

Table 14 and the discussion below summarize the national institutions involved in each stage of the implementation process.

Table 14. Implementing structures and regulatory functions in the Gambia

National implementation requirements	**Status of implementation in the country, including structures and staffing**
1. Pre-registration	
- Field testing of pesticides proposed for registration	- NARI performs field-based efficacy tests for all pesticides proposed for sale in CILSS. - Inadequate capacity human and infra-structure - Few staff and not specialized in pesticides and plant protection
- Established National Pesticide Management Board (NPMB) -Established Technical Task-forces under The NBMB -Established Management Committee under The NBMB	- Established by HCPMA 1994 - Performs some functions of (CNGP) - Meets irregularly with low institutional representation.
• Country sends representative to bi-annual CSP meetings	- The Gambia sends representatives since 1994
• CSP approves or disapproves pesticides	- The Gambia adapts the CSP list of approved pesticides
3. Post-registration	
• Register and monitor traders eligible to sell pesticides	- National environment Agency (NEA) and collaborators MOA, MH, NARI, Customs and excise - In practice many unregistered pesticides and unregistered traders sell pesticides in The Gambia
• Market monitoring to verify that traders sell only registered pesticides, verification of labelling and product expiration dates	- National Environment Agency is responsible for market enforcement and collaborations - Meagre travel and enforcement budget - Limited capacity to store seized products - List of registered traders available with NEA
• Test active ingredients and product quality	- No capacity, no testing conducted in The Gambia - Formulation laboratory at NEA non-functional due to lack of equipment and competent staff - Pesticide Residue Analytical laboratory at Plant Protection Services non-functional due to lack of

[31] S. 4 HCPCM Act 1994 (as amended)

	equipment and competent staff
• Monitor environmental impact	- Yes NEA and Projects - Hardly done on pesticides due to lack of capacity and funds
• Monitor impact on human health	- Yes NEA limited - Arrangements being undertaken for establishment of poisoning centers - Pesticides hazards are not reported to NEA probably at hospitals and information is confidential

The pre and post registration activities are implemented with a lot of difficulties, although there were certain achievements. One of the big issues is the control of pesticides sales by inspectors who are not sufficient number to efficiently exercise the task. In compliance with the law, traders (wholesalers, retailers, warehouses and commercial applicators) are required to get licenses from NEA and need to go through an interview to check his general knowledge of pesticides. Inspectors need to check these licenses and knowledge before checking the products. There are many cases in weekly markets where phytosanitary products sellers do not have these authorisations and sometimes do not have the appropriate product labels. In those cases, inspectors seize the product prohibited. Because of the low presence of NEA inspectors, the board trains and appoints inspectors in some institutions (customs office, agricultural departments).

Pre-registration

NARI is supposed to perform field-based efficacy tests for all pesticides proposed for sale in CILSS.

Registration

Usually, two Gambia representatives (Plant protection service and the registrar) participate in the CSP regulatory review meetings held twice a year in Bamako. Together with technical representatives of all member states, the CSP reviews applications and issues three categories of decisions on each product application: a) refusal; b) conditional approval, for three years; or c) full homologation for a period of five years and renewable thereafter. After provisional approval by the CSP, firms technically have three to six years to supply more detailed information on herbicide behavior in the environment (including rates of degradation and mobility in both soil and water), its impact on non-target organisms (including humans, fish, reptiles, algae, birds, bees and soil invertebrates) and residue analysis of affected foods (CSP 2015).

Post-registration

Traders who wish to import pesticides into the Gambia must register and request a formal certification from the NEA. Customs officials monitor actual border controls and import procedures, while monitoring of any domestic production, reformulation or packaging are the duties of the Ministry of Commerce. Control of counterfeiting and fraud, likewise, remain the province of Customs Department and Ministry of Commerce. Traders we interviewed claim that there are no significant quantities of unregistered and counterfeit products on sale in the Gambia markets. In most cases, these involve cross border smuggling across Senegal.

The Office of Registrar of Pesticides and Chemicals is located at NEA registers pesticide traders and monitors domestic markets. Under the Gambia's domestic pesticide regulations, if a trader wish to sell pesticides, he needs registration by the registrar. Currently, there is one laboratory at NEA but not equipped to evaluate the chemical composition of pesticide products or to assess product quality. The absence of a proper regulatory control on product quality weighs affects heavily both farmers and suppliers of registered pesticide products. Many of the stakeholders we interviewed do not consider the problem of counterfeiting, non-registration and lack of quality control to be reaching a critical level.

Table 15 below gives an overview of all laboratory infrastructure in the Gambia. According to Unitar (2003), a pesticide formulation laboratory NEA and the Department of of State for Fisheries, Natural Resources and the Environment located at Abuko is responsible for the analyses of pesticides and there is no residue laboratory. There are plans to upgrade the laboratory into a sub-regional reference Formulation Laboratory, through the Sahelian common pesticide registration system. According to UNEP-GEF (2006), the lack of adequate staff, the lack of regular supply of reference standards, the absence of a high pressure liquid chromatography for the analyses of certain components are the main constraints (UNEP-GESF, 2006). An agreement between Senegal and the Gambia pesticides policy makers has been reached that the pesticide residue analysis be carried out in Senegal by CERES LOCUTOX while the formulation analysis will be carried out at the formulation laboratory at Abuko in The Gambia (Unitar, 2003).

Table 15. Overview of Laboratory Infrastructure for Regulatory Chemical Analysis

Name	Location	Equipment/Capabilities	Purpose
1- National Drug Control Laboratory, Ministry of Health	Banjul	GC, UV – Spectrometry, TLC, pH	Drug Control Program and quality Control of Pharmaceuticals
2 – Water Quality Laboratory, Department of Water Resources, under NEA, Ministry of Forestry and Environment	Abuko	Flame Photometry, pH, titration, conductivity, Spectrophometry, Bacteriological analysis	Water quality monitoring and management, PCBs in soil, PM10 in air,
3 – Pesticides Analysis Laboratory, NEA	Abuko	GC/FID, wet chemistry, determination of flash point, melting point and density of substances	Quality Control of Pesticides
4 – Veterinary Laboratory, Department of Livestock Services	Abuko	Hematological, Parasitological and bacteriological analysis, ELISA	Monitoring of pathogenic bacteria in foodstuff and veterinary analysis
5 – Aflatoxin	Brikama	TLC for	Monitoring of

Laboratory, National Agricultural Research Institute		determination of Aflatoxin	aflatoxin levels in groundnut
6- Soil Analysis Laboratory, NARI	Brikama	Flame photometry, titration, microkjeldahl, pH	conductivity meter Soil analysis for research and services
7- Medical Research Council, Medical Research	Fajara	Flame photometer, spectrophotomet er	bacteriological analysis Medical Research in tropical diseases
8- NAWEC Laboratory	Serrekunda	Chemical and bacteriological analysis of water	Water quality monitoring
9- University of the Gambia, Chemistry Laboratory	Kanifing	Computerized analytical programs to measure dissolved oxygen, pH, colour, conductivity, temperature, pressure and humidity	Teaching Royal Victoria Teaching Banjul Blood parasite identification
10. Food and Nutritional Technical Services	Cape Point	Food and Nutrition Unit Bacteriological analysis	Food quality control
11- Hospital Laboratory	Banjul	Bacteriological and other pathogenic analysis	Treatments
12. Pesticide Residue Analytical Laboratory	Yundum	Plant Protection Services Yungum	Pesticide Residue in plants (inadequate equipment and lack of standards)
13. Pesticide Formulation Analysis Laboratory	Kanifing	National Environment Agency	Quality Control of Pesticides (inadequate equipment)

Source: Unitar, 2003 and field visits.

Safety and environmental monitoring

Empirical evidence on environmental impacts, remains limited in the Gambia. A small number of studies has examined the impact of insecticides on human health and the environment (Murphy, 2012; Ye, 2013; Kuye, 2006). However, to our knowledge, no studies of the environmental impact of herbicides have taken place in the Gambia. Instead, international evidence on pesticide formulations stated that a significant percentage of the pesticide products sold at local markets in The Gambia in 2005 are considered extremely hazardous (Murphy[32], 2012). Looking forward, ongoing concern about insecticide use

[32] However, Murphy did not look at crop pesticides. His study looked only at household insecticides.

(particularly in cotton production and in malaria and locust control) appears likely to increase pressure for improved environmental impact monitoring of all pesticides. Faye (2006) reported a few old cases where use of pesticides in the Gambia had caused some accidents: (i) a pollution of the Gambia river in 1993 from some pesticides (organochlorines, organophosphates and carbamates) has caused death of fish; (ii) some cattle were killed while eating grass near the Lower River and the North Bank Divisions due to chemical in 1996.

Table 16. Departments Involved in Pesticide Control and Regulation in the Gambia

Units	Relationship	Role
NEA	ensure that only approved products are used, laboratory control and	Ensure the respect of regulation involved in the definition of national policy of The Gambia related to pesticides •registers pesticide traders • monitors pesticide markets
Department of Agriculture of Ministry of Agriculture	In charge of providing extension and support services to extension agents and farmers. Within DoA, the Plant Protection Services is the Technical Unit in charge of protecting field crops and stored produce.	Technical adviser of agro-chemical used in agriculture for pest control .Monitor pests and disease attacks on crops and vegetables . primarily responsible for the use and application of pesticides Phytosanitary Services
-Department of Health Services o	Involved in the decision and eventual use of DDT as a control of the vector of malaria (special case)	. mandate to control diseases and their vectors . engaged to control malaria and use of insecticides
-Attorney General's Chambers o	Plays an active role in the process of ratification of conventions.	. responsible for drafting new laws and regulations
-Gambia Revenue Authority (Customs and Excise Department)	Parts of the enforcement personnel set up to monitor the import and use of pesticides.	. Collaborate with NEA and PPS control the entry of pesticides at the entry points
-Gambia Chamber of Commerce	Represents the private sector in the management of chemicals including pesticides	. role in the control of pesticides through sensitization and participation

Human and institutional capacity

According to Unitar (2003), there are both lack of human and material resources for the management of chemicals and/pesticides in general in The Gambia. Unitar (2003) mentioned in 2003 an estimated number of forty professional staff working in the field of chemicals management in the Gambia from government Departments. Unitar (2003) cited "chemists, biologists, pharmacists, laboratory technicians, public health inspectors, veterinarians, doctors, entomologists and phytopathologists housed in the National Environment Agency, Department of State for Health, Department of State for Agriculture, State Department of Water Resources" respectively. However, there is no specific information about human and institutional capacity for the pesticides management although, Unitar (2003) mentioned that the NEA is constrained by an insufficient manpower in its monitoring of pesticide sale, use and application in the cities and the provinces.

The same author did the inventory of laboratories (cf. table 15) and noted that "there are quite a few existing laboratories in the private sector although some of the equipment used are not very sophisticated".

Table 17. Staffing and Resources for Implementing Agencies in The Gambia*

Institution	Human resources (number of qualified persons)	Financial resources • budget • fees collected
National Pesticide Management Board (NPMB)	- NA	- NA
Office of Registrar of Pesticides and Chemicals	- NA	- NA
National Agricultural Research Institute (NARI)	14	- NA - NA
Plant Protection Services	43	- NA - D150,000.00
Gambia Chamber of Commerce	- NA	- NA
Gambia Revenue Authority (Customs and Excise Department)	- NA	D3,059,388,00 (detailed in annex 3)
Testing laboratories	- NA	- NA
Toxicology and Environmental Quality unit	- NA	- NA
• National Health Laboratory	- NA	- NA

'*Note that figures for many institutions were not available (NA).

5. CONCLUSION

The case study revealed that the sale of chemical pesticides has increased in the Gambia with expanding vegetables production and exports. There is limited data on pesticides imports. There are a limited number of importers although a lot of unregistered pesticides are on sale on the markets. There are a lot of trans-boundary movements of pesticides to weekly markets where dealers or sellers are not registered.

The Gambia has legislation which is in harmony with the regional policy and participates in the CSP registration process. However, the country does not have a National Committee on Pesticide Management per se, retarding the implementation of many pre and post registration activities.

The control of the pesticides sold on the markets is constrained by the insufficient number of inspectors and lab equipment necessary for pre and post registration analysis and tests (biological efficiency, analysis of residues, etc.).

To improve the management of pesticides in The Gambia the implementation of the post registration activities should be strengthened by:

- Creating a proper CNPG in charge of monitoring pesticide issues in the Gambia as recommended by CSP;
- Building the technical capacity of pesticide inspectors and controllers;
- Providing control structures with adequate human, technical and financial resources;
- Capacity building for laboratory analysis of formulations and pesticide residues;
- Establishing pesticide control centers, including testing of pesticide levels in human blood;
- Providing secure facilities for the storage of pesticides for disposal;
- Organizing awareness raising campaigns on pesticides at Member State level.

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ANNEX

ANNEX 1. List of persons interviewed

1. Landing Sonko and team, Deputy director at Plant Protection Services at Yundum
2. Cissé Mamadou, Owner of Gambia Horticulture Enterprise (GHE) at Jeshuwamg.
3. Ansoumana Jarju, DG NARI at Brikama
4. Demba Diallo, Deputy Director, NARI
5. Lamine Diba, Economist, NARI
6. Mme Oussinatou Drammet, Pest Managegement Unit), NARI
7. Baro Ousmane (retailer) at Serrekunda
8. Youssouf Noba (retailer) at Serrekunda
9. Haja Latrikounda, major seller at Latrikounda
10. Farba Seck her husband- Dakar phone 776460010, e-mail: entrepriseaeb38@yahoo.fr), Ag Input store owner
11. Momodou B. Canteh, formerly registrar at National Environmental Agency (NER), now at Health and Environment Information System
12. Omar Ba, National Registrar of Pesticides (located at NEA) at Kanifing
13. Ndèye Sire Bakoré, Executive Director of the National Environment Agency at Kanifing
14. Lamin Jobe and Bay Saine (tel 3838203)
15. Konaté Sanja, from Plant Protection Services (PPS) at Yundum- working on pesticide residue

ANNEX 2. List of pesticides found on the market in The Gambia (2016)

No	Product Name	WHO Class	Firm registering this pesticide	Local Distributor	Active Ingredient (s)	Registration Number	Uses
	Insecticides						
1.	Ficam VC	II	Bayer Crop Sciences	GHE	Bendiacarb	0562-A-A0/In/06-12/APV-SAHEL	Insecticide against adult mosquitos' house-hold.
2.	Furadan			1. GHE	Carbofuran	Not registered	Control of soil insects and nematodes
3.	Dursban 4 EC	II	Dow Agro Siences	1. Haja Latrikunda 2. Sangol firm 3. GHE	Chlorpyrifos-ethyl (480 g/l)	0011-113/In/07-12/HOM-SAHEL	Insecticide authorised against fruit tree pests, coffee, cotton and vegetables
4.	Dursban 5% DP	III	Dow Agro Siences	GHE GHE	Chlorpyrifos-ethyl (50 g/Kg)	0002-H3/In/07-12/HOM-SAHEL	Insecticide authorised against grasshoppers, termites in food crops
5.	Dursban 5G	III	Dow Agro Siences	GHE	Chlorpyrifos-ethyl (50g/ Kg)	0003-H3/In/07-12/HOM-SAHEL	Insecticide authorised against termites, nocturnal, cutworms in maize and sorghum
6.	Dursban 450 ULV	II	Dow Agro Siences	GHE	Chlorpyrifos-ethyl (450 g/l)	0001-H3/In/07-12/HOM-SAHEL	Insecticide authorised against locusts and grasshoppers on leaves
7.	Dursban 240 EC	II	Dow Agro Siences	GHE	Chlorpyrifos-ethyl (480 g/l)	0004-H3/In/07-12/HOM-SAHEL	Insecticide authorised against grasshoppers and desert locust
8.	Dexban 48% EC	II	Yufull Industry Co. , Ltd	Gambia Horticultural Enterprises (GHE)	Chlorpyrifos 48%	Not registered	Insecticide for soil and foliar pest of both biting and sucking insects such as termites fruit flies, aphids, army worms red spider mites etc. on vegetables, fruits, field crops, buildings, and domestic pests
9.	Chorsban 480 EC	II	Senegal	Yuspha Noba Saikou Jabie	Chlorpyrifos-ethyl	Not registered	for soil and foliar pest of both biting and sucking insects such as termites fruit flies

10	Decis 25 EC,	II	Bayer Crop Science AG	1. Haja Latrikunda 2. Sangol firm	Deltamethrin (25 g/l)	0451-A1/In/05-11/APV-SAHEL	Insecticide authorised against Helicoverpa on tomatoes, green beens and beetles on okra
11	Deltacal	II	Arysta life sciences	GHE	Deltamethrin (12.5 g/l)	0650-A1/In/05-14/APV SAHEL	Insecticide authorised against Helicoverpa in beans
12	Deltacal	II	Arysta life sciences	GHE	Deltamethrin (12.5 g/l)	0650-A0-XI/In/05-13/APV SAHEL	Insecticide authorised against Helicoverpa amigera and white flies in tomato
13	Deltamethrin 25EC	II	Yufull Industry Co., Ltd	1. Gambia Horticultural Enterprises (GHE) 2. Saikou Jabbie	Deltamethrin 25g/L	0451-A1/In/05-11/APV-SAHEL	Controls a wide range of insect and mite pest such as army worm, borers, aphids of cabbage, soy bean, rice, peanut, maize, cotton, uncultivated land, and sanitary purposes
14	Abamectin 1.8EC	II	Yufull Industry Co. , Ltd	1. Gambia Horticultural Enterprises (GHE)	Abamectin 18g/L	0858-A0/Ac/12-15/APV-SAHEL	An acaricide, miticide, insecticide, and seed protectant for pest such as spider mites, thrips, leaf miners, bedbugs, etc. on roses/flowers, vegetables, citrus, pear, and nut tree crops, and for sanitary purposes
15	Abamec 18	II	Senegal	1. Yuspha Noba	Abamectin 18g/l	0858-A0/Ac/12-15/APV-SAHEL	An acaricide, miticide, insecticide, and seed protectant for pest such as spider mites, thrips, leaf miners, bedbugs, etc.
16	Dimethoate	Not given	Yufull Industry Co. , Ltd	1. Gambia Horticultural Enterprises (GHE)	Dimethoate 40% EC	066-A0/In/11-13/APV-SAHEL	Systemic organophosphate insecticide and acaricide with contact and stomach action for sucking and chewing pest aphids, whiteflies and mites on rice, orange tree, vegetables etc.
17	Dimeto 400 EC	Not given	Senegal	1. Yuspha Noba	Dimethoate	066-A0/In/11-13/APV-SAHEL	Famous against pests of melon sucking and piercing insects

18	Spithoate 300 EC	Not given	Senegal	1. Afric Agro Action	Dimethoate	066-A0/In/11-13/APV-SAHEL	Insecticide and acaricide with contact and stomach action suitable for control of sucking and chewing pest aphids, whiteflies and mites on rice, orange tree, vegetables, cotton, sweet potato, and sorghum
19	Cypermethrin	Not given	Yufull Industry Co. , Ltd	1. Gambia Horticultural Enterprises (GHE)	Cypermethrin 10% EC	0659-A0/In/11-13/APV-SAHEL	A insecticide active in eradication of the most difficult insect pests such as cut worms, whitefly, bores, fruit worms, plant lice, flies of tomato, pepper, okra, mangoes, cashew, citrus trees, and for domestic pest
20	Cypermet	Not given	Senegal	1. Afric Agro Action	Cypermethrin	0659-A0/In/11-13/APV-SAHEL	A insecticide active in eradication of the most difficult insect pests such as cut worms, whitefly, bores, fruit worms, f tomato, pepper, okra, mangoes etc.
21	Alphacal	Not given	Senegal	1. Afric Agro Action	Alphacypermethrin 100g/l	Not registered	Large spectrum systemic insecticide annual crops
22	K-Othrine 250 WG	III	Bayer PTV	1. Haja Latrikunda 2. Sangol firm	Deltamethrin (250 g/kg)	0590-A1-XI/In/07-12/APV SAHEL	Insecticide authorised for public health against flies and ….
23	Finical 3 DP	III	ARYSTA LIFESCIENCE		Fenitrothion	0455-H0/In11-11/HOM-SAHEL	Insecticide authorised against acridiens
24	Fenical 400UL	III	ARYSTA LIFESCIENCE		Fenitrothion	0456-H0/In11-11/HOM-SAHEL	Insecticide authorised against acridiens
25	Karate	Not given	Not given	1. Haja Latrikunda 2. Sangol firm	Lambda-cyhalothrin	Not registered	Insecticide authorised against cabbage and cotton
26	K-Optimal	III	SCPA SIVEX INTERNATIONAL (SS1)		Lambda-cyhalothrin (15 g/l)/ acetamipride (20 g/kg)	0586-A1/In/01-13/APV-SAHEL	Insecticide authorised against cabbage and cotton
27	Actellic 50 EC	III	SYNGENTA CROP PROTECTION AG	1. Haja Latrikunda 2. Sangol firm 3. GHE	Pirimiphos-methyl (50 g/l)	0167-A1/In/-13/APV-SAHEL	Insecticide authorised for public health use against insects

28	Actellic 300 CS	U	SYNGENTA CROP PROTECTION AG	1. Haja Latrikunda 2. Sangol firm 3. GHE	Pirimiphos-methyl (300 g/l)	0747-A1/In/-13/APV-SAHEL	Insecticide authorised for public health use against insects
29	Actellic Super Dust	III	SYNGENTA	1. Haja Latrikunda 2. Sangol firm 3. GHE	Permethrine (3 g/kg) / Pirimiphos-methyl (50 g/l)	0649-A1/In/-14/APV-SAHEL	Insecticide authorised for use against insects
30	Actellic Gold Dust	U	SYNGENTA		Pirimiphos-methyl (16 g/l) Thiamethoxam (3.6g/kg)	0813-A0/In/-11/APV-SAHEL	Insecticide utilise pour la protection des denrees stockees
31	Dimet 400 EC	Not given	Senegal	Saikou Jabbie	Dimethoate	Not registered	Against sucking and piercing insects
32	Pacharr 25 EC	Not given	Senegal	Saikou Jabbie	Acetamipride 1g/l + Lambdacyhalothrin 1g/l	Not registered	Against sucking and piercing insects
33	Good matox 500 EC	Not given	Senegal/Essence fine chemical Ltd	Yusupha Nuba	Malathion	Not registered	Against pests of fruit trees
34	Tiger benzoate	Not given	Senegal	Yusupha Nuba	Emamtectin	Not registered	Broad spectrum for use in vegetables
	Herbicides						
35	Stomp 33 EC	Not given	Yufull Industry Co. , Ltd	1. Haja Latrikunda 2. Sangol firm 3. GHE)	Pendimethalin 33%	0517-A1/He/05-11/APV-SAHIL)	For the control of annual, perennial, and aquatic weeds on spring soybean, spring corn, summer corn, cotton, peanut, potato, rice, and onions
36	Quizar super	Not given	Yufull Industry Co. , Ltd	Gambia Horticultural Enterprises (GHE)	Quizalofop-P-Ethyl 100g/L	Not registered	It is a selective, post-emergence phenoxy herbicide used in the control of annual and perennial grass weeds in cotton, vegetables, peanut, potato, soy, sugar beets etc
37	Yuperstar	Not given	Yufull Industry Co. , Ltd	Gambia Horticultural Enterprises (GHE)	Propanil 360g/L	Not registered	Propanil is used to control various kinds of weeds and grasses especially effective for cockspur grass, barnyard grass, broadleaves to weeds on rice fields
38	Propanil	Not given	Senegal Syngenta	Afric Agro Action	Primagold	Not registered	Used as selective post-emergence herbicide in the control of grasses and broad leaves in rice
39	Prochlor super	Not given	Yufull Industry Co. , Ltd	Gambia Horticultural Enterprises	Prochloraz 25%	Not registered	A broad spectrum fungicide for the control of powdery

				(GHE)			mildew, anthracnose, and spot on peanut, orange, rice, mango, and other application
40	Aligator	Not given	Senegal	Sangol Firm	Pendal	Not registered	Rice herbicide
41	Rival 360 SL	III	SEMBIOS LLC	1. Haja Latrikunda 2. Sangol firm 3. GHE	Glyphosate (360 g/l)	0668-A0/He/11-13/APV-SAHEL	Herbicide authorise en post-levee contre le adventices en riziculture irriguee et de bas-fonds
42	Roundup Biosec 68 SG	III	MONSANTO		Glyphosate (680 g/kg)	0261-H0/He/11-10/HOM-SAHEL	Herbicide systematique foliaire no selectif autorise centre les mauvaises herbes annuelles et perennes avant semis de toutes cultures
43	Roundup 360 K	III	MONSANTO	1. Haja Latrikunda 2. Sangol firm 3. GHE	Glyphosate (360 g/kg)	0617-AI/He/05-14/APV-SAHEL	Herbicide autorise en post-levee contre les mauvaises herbes annuelles et perennes avant semis des cultures
44	Roundup 450 Turbo K	III	MONSANTO		Glyphosate (450 g/kg)	0290-/Ho/He/11-11/HOM-SAHEL	Herbicide systemic non selective authozied against annual and perennial before sowing or planting of all types of crops
45	Roundup Powermax	III	MONSANTO		Glyphosate (540 g/l)	0553-AI/He/11-14/APV-SAHEL	Herbicide systemique non selectif autorise contre les mauvaises herbes annuelles et perennes avant plantation ou semis des cultures
46	Roundup	II	Monsanto	1. Haja Latrikunda 2. Sangol firm 3. GHE	Glyphosate	0261-110/He/11-10/HOM-SAHEL	Foliar Systemic herbicide against non-selective against annual and perennial weeds before sowing of all crops
47	Glyphosate 41%SL	Not given	Yufull Industry Co. , Ltd	1. Gambia Horticultural Enterprises (GHE)	Glyphosate 41%	0484-A1/He/05-11/APV-SAHIL	Used in the control of green annual weeds(grasses and broad leaves, ryegrasses) perennial weeds (bamboo, dlady grass, couch), pampas grass, woody weeds, mutgrass, pasparum, and aquatic weeds
48	Glyphadarr	Not	Senegal	Sakou Jbbie	Glyphosate	Not	Used in the control

	360 g/l	given				registered	of green annual weeds grasses and broad leaves.
49	Camix 500 SE	III	SYNGENTA		Mesotrione (83.3 g/l) / s-metolachlore (416.7 g/l)	O606-A1/He/06-13/APV-SAHEL	Herbicide autorise en pre-levee ou post-levee precoce contre les adventices du mais
50	Codal Gold 412-5 DC	III	SYNGENTA		Prometryne (250 g/l) / s-metolachlore (162.5 g/l)	0470-H0/He/06-12/HOM-SAHEL	Herbicide autorise en pre-levee contre les plantes adventices du cotonnier
51	Corignena 500 EC	III	BARRY AGROCHEM		Metachlore 333 g/l Terbutryne 167 g/l	0811-A0/He/11-14/APV-SAHEL	Herbicide en prelevee contre les adventices du cotonnier
52	Cotonet 500 EC	III	DTE		Metolachlore (333 g/l) / terbutryne (167 g/l)	0519-A1/He/11-13/APV-SAHEL	Herbicide autorise en post-semis et pre-levee contre les mauvaises herbes du cotonnier
53	Oxanet 250 EC	IV	DTE		Oxadiazon (250 g/l)	0802-A0/He/11-14/APV-SAHEL	Herbicide contre les adventices du riz
54	Callistar 250 EC	III	ARYSTA LIFESCIENCE		Oxadiazon (250 g/l)	0615-A1/He/11-13/APV-SAHEL	Herbicide selectif autorise contre les adventices du riz irrigue ou pluvial
55	Oxariz 250 EC	III	SAVANA		Oxadiazon (250 g/l)	0575-A1/He/07-12/APV-SAH|EL	Herbicide autorise en post-levee contre les plantes advantices (dicotylees et graminees annuelles) du riz
	Fungicides						
56	Dithane M 45	III	DOW AGRO SCIENCES	1. Haja Latrikunda 2. GHE 3. Sangol	Mancozeb (800 g/kg)	0466-A1/Fo/07-12/APV-SAHEL	Fingicide a large spectre autorise contre les maladies des culture maraicheres
57	Coga 80 WP	III	SAVANA	1. Haja Latrikunda 2. GHE 3. Sangol	Mancozeb (800 g/kg)	O698-A0/Fo/11-12/APV-SAHEL	Fungicide de contact a large spectre pour les cultures maraicheres, fruiteres, vivrieres et florales
58	Dithane, R	Not given		1. Haja Latrikunda 2. GHE 3. Sangol	Mancozeb	Not registered	
59	Yuhomil	Not given	Yufull Industry Co. , Ltd	1. Gambia Horticultural Enterprises (GHE)	Metalaxyl 8% + Mancozeb 64%	Not registered (Mancoceb 800 is registered and expired in	A good mixture of systemic fungicide by contact: quick foliar absorption (Metalaxyl) and long residual activity

						2015	(Mancozeb) for the control of downy mildew, late blight, anthracnose, alternaria spp etc. on cauliflower, lettuce, head cabbage, onion, melon, water melon, potato, cucumber, vine, and tomato
60	Seedox	Not given	Yufull Industry Co. , Ltd	Gambia Horticultural Enterprises (GHE)	Imidachlorpride 10% + metalaxyl 10% + carbendazine 10%	Not registered	Seed treatment effective in preventing and killing of Nephotettix cincticeps, Delphacidae, Phytophthira, Drosophila, weevils, rice borer, Bemisia tabaci etc. in rice, cotton, vegetables, fruit trees, maize, and potato seeds and crops
61	Calthio C 50 WS	II	ARYSTA LIFESCIENCE		Thirame (250 /kg) / chlorpyrifos ethyl (250 g/kg)	0551-AI/In.Fo/11-13/APV-SAHEL	Insecticide/Fungicide authorise for treatment of insects et les champignons en traitment de semences du cotonnier
62	Calthio C 1350 FS	II	ARYSTA LIFESCIENCE		Imidacloprid (250 g/l) Thirame (100 g/l)	0604-AI/In.Fo/11-14/APV-SAHEL	Insecticide/Fungicide authorise for treatment of semences du cotonnier

Source: Market Survey Team (Plant protection Services and Mission by Michigan State University 2016 and the Liste Globale CSP May 2016.

Annex 3. Pesticide Imports, 2016

Commodity	CIF	GROSS	Taxes	Date
Snipper	3.444.00	75.00	606.00	7/1/2016
Snipper	9.116.00	2000.00	1,602.00	9/15/2016
Snipper	3,725.55	2,500.00	655.00	7/27/2016
Snipper	4,821.30	1,500.00	848.00	7/27/2016
Snipper	3,785.60	1,600.00	662.00	3/14/2016
Insecticide Killer	291,620.00	28,000.00	51, 181.00	2/10/2016
Insecticide Spray	319,082.40	25,350.00	56,000.00	7/26/2016
Class Cleaner	3,764.70	350.00	662.00	4/9/2016
Snipper	4,033.80	1,500.00	709.00	8/31/2016
Snipper	4,834.20	2,000.00	849.00	10/6/2016
Snipper	2,082.50	175.00	367.00	2/20/2016
Snipper	5,550.00	900.00	976.00	10/14/2016
Snipper	9,574.40	1,440.00	1,682.00	12/20/2016
Snipper	1,289.40	300.00	227.00	6/7/2016
Snipper	5,739.50	1,200.00	1008.00	8/11/2016
Bendiocarb WP	6,198,515.30	2,014.00	-	9/19/2016
Insecticide Spray	6,326.30	1,000.00	1,112.00	7/13/2016
Snipper	4,682.70	500.00	823.00	11/18/2016
Snipper	2,942.55	1,750.00	518.00	9/9/2016
Snipper	3,962.70	800.00	697.00	10/21/2016
Snipper	3,729.60	200.00	656.00	10/19/2016
Snipper	4,132.80	500.00	726.00	7/1/2016
Snipper	2,510.40	1,200.00	442.00	3/14/2016
Snipper	3,346.40	250.00	588.00	4/9/2016
Snipper	3,332.80	100.00	586.00	2/10/2016
Snipper	3,604.00	800.00	634.00	5/5/2016
Snipper	3,790.15	1,200.00	666.00	8/20/2016
Snipper	2,689.20	250.00	473.00	9/1/2016
Herbicides	987,005.55	8,000.00	25,170.00	7/25/2016
Disinfectants	3,652.45	245.00	642.00	9/23/2016
Dettol 12 x 250 ml Disinfectant	9,338.03	42.00	1,640.00	3/24/2016
Vap Spray 24 x 400G Insecticide	824.72	52.00	146.00	10/1/2016
Disinfectants	2,935.20	80.00	517.00	10/1/2016
Dettol 12 x 250 ml Disinfectant	4,477.72	172.00	787.00	3/21/2016
Snipper	8,694.60	2,000.00	1,527.00	2/1/2016
Snipper	7,578.00	2,000.00	1,331.00	4/25/2016
Snipper	4,469.85	960.00	786.00	11/16/2016
Insecticide	94,481.99	2,548.00	16583.00	5/2/2016
Insecticide	43,951.80	1,200.00	7,715.00	6/20/2016
Insecticide	6,523.50	200.00	1,147.00	70/19/2016
Dettol liquid	694.71	170.00	123.00	7/8/2016
Dettol liquid	205,981.30	8,877.00	36,151.00	11/10/2016
Insecticide	10,874.11	1,925.00	1,909.00	10/18/2016
Disinfectants 4x5l TR, 12X500ml	6,590.60	1,050.00	1,158.00	4/29/2016
Disinfectants 4x5l TR, 12X500ml	22,163.30	300.00	3,891.00	80/16/2016
Dettol liquid 48 bottles	32,235.00	300.00	5,659.00	6/10/2016
Dettol liquid 24-48 PCS	39,738.50	300.00	6,975.00	4/6/2016

Dettol liquid 24-48PCS	33,717.60	1,210.00	5919.00	11/2/2016
Dettol liquid 24-48 PCS	7,459.20	2000.00	1,310.00	10/18/2016
Snipper	32,285.55	2,705.00	5,667.00	10/4/2016
Disinfectant 3x5l TR	2,081.25	70.00	367.00	10/13/2016
Dettol liquid 12 x 500ml	2,935.57	75.00	517.00	7/23/2016
Dettol liquid 24 x 500 ml	1,471.05	130.00	259.00	4/18/2016
KK Disinfectant 3 X 5L TR	15,049.67	1,275.00	2,643.00	2/24/2016
Dettol liguid 24 x 500ml	729.05	65.00	130.00	2/24/2016
Dettol liquid 24 x 500 ml	696.32	65.00	123.00	1/20/2016
Disinfectants	25,435.04	11,976.48	4,466.00	12/15/2016
Disinfectants	46, 317.06	6,600.00	8,130.00	4/18/2016
Disinfectants	36,689.27	5,800.00	6,440.00	10/10/2016
Baygon Spray Insecticide	47, 608.31	3, 430.00	8, 357.00	9/16/2016
Disinfectant	40, 799.98	8,725.00	7,161.00	8/8/2016
Insecticide	2,054.37	175.00	362.00	12/7/2016
Insecticide	878.60	185.00	155.00	8/8/2016
Disinfectant	438.80	25.00	78.00	12/19/2016
Insecticide	68,659.78	8,359.00	12,051.00	11/25/2016
Dettol	17,830.90	65.00	3,131.00	7/23/2016
Insecticide	832,60	80.00	147.00	3/17/2016
Dettol liquid	34,268.85	1,500	6,016.00	5/17/2016
Dettol	21,660.00	1,819.00	3,802.00	1/22/2016
Disinfectant X20P	61, 187.80	1,750.00	10,740.00	6/14/2016
Mosquito coil	683,760.83	69,300.00	120,001.00	1/8/2016
Lanju brand black mosquito coil	284, 946.25	8,752.00	50,009.00	10/14/2016
Lanju brand mosquito coil	1,139,626.98	113,685.00	200,006.00	9/8/2016
Lanju brand black mosquito coil	1,424,501.33	113,750.00	250,002.00	11/11/2016
Lanju brand black mosquito coil	1,139,601.12	115,750.00	200,002	8/11/2016
Lanju brand mosquito coil	683,786.	68,250.00	120,005	6/25/2016
Lanju brand black mosquito coil	455,840,55	45,500.00	80,001.00	4/27/2016
black mosquito coil	285,126.55	24,775.00	50,041.00	9/21/2016
Sir Black Mosquito Coil	285,568.07	25,649.00	50,119.00	5/19/2016
Disinfectant	533.28	45.00	95.00	9/15/2016
Snipper	3,653.30	250.00	642.00	6/07/2016
Repellent Cream	14,240.00	83.00	2,500.00	5/19/2016
Snipper	11,395.00	1,500.00	2,001.00	9/15/2016
Snipper	5,227.20	385.00	919.00	11/29/2016
Snipper	6,937.00	75.00	1,219.00	10/14/2016
Snipper	3,479.00	400.00	611.00	7/20/2016
Snipper	3,540.00	500.00	622.00	2/16/2016
Snipper	1,795.00	500.00	316.00	1/5/2016
Kills Mosquito	656.55	10.00	117.00	12/28/2016
Disinfectant	541.17	35.00	97.00	4/6/2016
Black Mosquito Coil	227,931.09.00	26,176.00	40,003.00	7/21/2016
Mosquito Coil	284,944.66	24,780.00	50,009.00	11/8/2016
Insecticide	440,763.96	21,600.00	77,355.00	11/1/2016
Insecticide	519.612.00	26,163.00	91,193.00	9/15/2016
Insecticide	512,837.36	26,163.00	90,004.00	6/13/2016
Insecticide	474,924.00	26,163.00	83,351.00	2/26/2016
Insecticide Powder X40PKT	28,236.60	200.00	4.957.00	9/1/2016
Disinfectant X20P	47,728.50	1,320.00	8,378.00	2/8/2016
Snipper	4,158.15	4,180.00	731.00	12/28/2016
Snipper	4,527.00	200.00	796.00	9/142016

Assorted Dettol	13,875.00	600.00	2,437.00	10/17/2016
Dettol Liquid	19,885.00	1,000.00	3,.491.00	1/11/2016
Dettol Liquid X 24 PCS	21,200.00	1,650.00	3,721.00	5/9/2016
Assorted Dettol Liquid	16,359.00	700.00	2,872.00	7/4/2016
Dettol Liquid X 48 PCS	3,700.00	100.00	650.00	10/17/2016
Glyphosate (Assorted Chemicals)	40.00	5,578.00	10,414.00	1/18/2016
Oberon	.00	16.00	1,528.00	4/4/2016
Agricultural Pesticides	.00	310.00	943.00	8/16/2016
Fargro	.00	1,05.00	5,75300	5/3/2016
Water Wax	.00	2,050.00	2,013.00	4/8/2016
Topel	73,928.10	152.00	1,886.00	3/19/2016
Dettol	67,758.13	3,995.00	11,893.00	1/9/2016
Toilet Blocks	4,810.57	553.00	846.00	2/22/2016
Dettol Soap	31,659.61	1,187.00	5,557.00	3/16/2016
Baygon Spray	39,631.76	983.00	6,957.00	3/16/2016
Toilet Cleaner Block	6,771.60	685.00	1,189.00	5/26/2016
Disinfectant	44,604.78	1,847.00	7,830.00	7/12/2016
Dettol	77,597.03	5,088.00	13,619.00	7/21/2016
Dettol	5,389.61	147.00	947.00	8/24/2016
Toilet Cleaner Block	22,295.47	1,653.00	3,914.00	9/9/2016
Toilet Cleaner Blocks	10,769.22	805.00	1,891.00	10/21/2016
Dettol	62,445.62	2,919.00	10,960.00	12/16/2016
Dettol	13,054.30	605.00	2,292.00	12/16/2016
Baygon Spray	50,393.98	1,586.00	8,845.00	12/16/2016
Mosquito Sprat	2,308.80	2000.00	407.00	4/25/2016
Insecticide	22,790.00	1,725.00	4,001.00	9/16/2016
Insecticide	4,437.45	100.00	780.00	10/28/2016
Snipper	4,257.00	1,000.00	748.00	5/18/2016
Snipper	7,659.75	1000.00	1,345.00	12/29/2016
Snipper	9,585.40	600.00	1,683.00	3/19/2016
Snipper	10,256.40	600.00	1,801.00	3/19/2016
Mosquito repellent	12,485.20	570.00	2,192.00	3/19/2016
Home Pest Control	285,294.30	12000.00	50,070.00	3/19/2016
Face/Hand Wash	12,825.00	450.00	2,252.00	3/19/2016
Dettol Lquid X500ML	13,893.75	525.00	2,439.00	3/19/2016
Face Hand Wash	20,409.60	220.00	3,584.00	4/28/2016
Dettol Liquid	22,323.00	525.00	3,920.00	4/28/2016
Disinfectants	1,412.80	4,250.00	249.00	8/16/2016
Dettol Antiseptic Lquid	5,207.50	1,050.00	915.00	2/26/2016
Snipper	3,790.15	200.00	666.00	8/17/2016
Rambo Insecticide	85,500.00	521.00	15,006.00	5/24/2016
Snipper	7,565.40	1500.00	1,329.00	4/18/2016
Snipper	2,188.50	1,500.00	385.00	12/28/2016
	19,819,696.39	**978,313,48**	**2,110,106.00**	

Source: Gambia Revenue Authorith.