Further Written Evidence by Georgina Downs, UK Pesticides Campaign

1.1 During the Committee's oral evidence sessions on 28th November 2012 and 6th February 2013 there were a few things that I undertook to send in subsequently in writing.

i) Confirmation of the 2 chemicals involved in the 2009 Parkinson's study

ii) Studies related to pesticide exposure and adverse health impacts on farmers

iii) Studies related to pesticide exposure and Motor Neurone Disease (MND)

1.2 In addition, I will also include in this further written evidence information regarding a very important review that is currently being published in *Toxicology and Applied Pharmacology* in relation to pesticide exposure and human chronic diseases.

i) Confirmation of the 2 chemicals involved in the 2009 Parkinson's study

1.3 During the oral evidence session on 28th November 2012 I referred to a reputable study published in March 2009 that found that exposure to just two pesticides within 500 metres of residents' homes increased the risk of Parkinson's disease by 75%. Zac Goldsmith MP then asked me which were the chemicals involved in the study. I said Paraquat and Maneb, but undertook to check this and let members know subsequently in writing.

1.4 Having checked this I can confirm that the 2 chemicals involved in the study were indeed Paraquat and Maneb. For members information the abstract of this study entitled *"Parkinson's Disease and Residential Exposure to Maneb and Paraquat From Agricultural Applications in the Central Valley of California,"* by Sadie Costello, Myles Cockburn, Jeff Bronstein, Xinbo Zhang, and Beate Ritz, can be seen at:- http://www.ncbi.nlm.nih.gov/pubmed/19270050 The full paper in pdf can be provided on request.

ii) Studies related to pesticide exposure and adverse health impacts on farmers

1.5 During the oral evidence session on 28th Nov. 2012 when I was referring to the adverse health impacts of pesticides, Mark Spencer MP and Zac Goldsmith MP enquired about whether there were any studies regarding pesticides impacting on the health of farmers.

1.6 I pointed out that the British Medical Association (BMA) report in 1990 had highlighted quite a number of different studies that had been carried out up to that time (ie. 1990) regarding different cancers, lymphomas and leukaemia in farmers and operators. (For reference the BMA report was entitled "*The BMA Guide to Pesticides, Chemicals and Health",* BMA (Edward Arnold) 1990, 1992). However, I stressed the fact that the British Medical Association's report was 20 years ago and that there have been a considerable number of other studies since then, and I therefore undertook to provide Committee members subsequently in writing with information on examples of other such studies.

1.7 The important review that I referred to at paragraph 1.2 above, and that is included in further detail in section iv) below, that is currently being published in *Toxicology and Applied Pharmacology* in relation to pesticide exposure and human chronic diseases, includes references to a large number of studies of adverse health impacts of pesticides on farmers and others occupationally exposed. A full copy of this important review is being provided for Committee members' consideration and therefore members will be able to see the considerable number of studies included in the references section regarding the adverse health impacts of pesticides on farmers and others occupationally exposed. *(NB. A quick way to do this is to search the document using the key words "farmer" and "occupation").* Also, just to highlight that the main text of the review points out that the first reports on the association of pesticides with cancer were presented around 50 years ago regarding higher prevalence of lung and skin cancer in the farmers using insecticides in grape fields (Jungmann, 1966; Roth, 1958; Thiers et al., 1967). It also points out that there have been several reports on increased rate of asthma in people occupationally exposed to pesticides (Hernandez et al., 2011), and that moreover, the result of an agricultural health study indicated that exposure to some pesticides may increase the risk of chronic obstructive pulmonary disease (COPD) in farmers (Hoppin et al., 2007**). For further detail of the review being published in *Toxicology and Applied Pharmacology* in relation to pesticide exposure and human chronic diseases see section iv) below.**

1.8 I also pointed out during the oral evidence session on 28th November 2012 that the campaign I run does not just receive reports of adverse health effects from residents and other members of the public, but also from farmers, sprayers, ex-sprayers, ex-farm managers etc., particularly in relation to chronic effects such as neurological conditions and cancers. I would also point out to Committee members that I have sent the Committee

clerks a copy of the DVD containing the two videos that the campaign I run produced entitled *"Pesticide Exposures for People in Agricultural Areas – Part 1 Pesticides in the Air; Part 2 The Hidden Costs."* I referred to this DVD in paragraphs 1.4, 3.15(b). 3.19, and in footnote 3, of the written evidence to the Committee, dated 9th November 2012. The second video on the DVD featured, just as an example, a few of the individuals and families from all over the country reporting acute and/or chronic adverse health effects in rural communities surrounded by sprayed fields, and although those featured were predominantly residents reporting adverse health impacts, just over half way through there is a former farm manager and sprayer operator who has long term chronic health damage (particularly neurological damage) pointing out his experiences with pesticides. It is important to reiterate that the former farm manager/sprayer operator on the DVD is just one of a number of farmers that have contacted the campaign I run over the years to report acute and/or chronic adverse health impacts as a result of their pesticide exposure.

iii) Studies related to pesticide exposure and Motor Neurone Disease (MND)

1.9 During the oral evidence session on 6th February 2013 Chris Evans MP expressed specific interest in any studies related to pesticide exposure and Motor Neurone Disease (MND) and I therefore undertook to provide members with examples of such studies in writing.

1.10 The important review that I referred to at paragraph 1.2 above, and that is included in further detail in section iv) below, that is currently being published in *Toxicology and Applied Pharmacology* in relation to pesticide exposure and human chronic diseases, includes references to a number of studies related to pesticide exposure and Motor Neurone Disease (MND). These include, amongst others,

- Doi, H., Kikuchi, H., Murai, H., Kawano, Y., Shigeto, H., Ohyagi, Y., Kira, J., 2006. Motor neuron disorder simulating ALS induced by chronic inhalation of pyrethroid insecticides. Neurology 67 (10), 1894–1895;

- K., Tzatzarakis, M.N., Mastorodemos, V., Plaitakis, A., Tsatsakis, A.M., 2011. A case report of motor neuron disease in a patient showing significant level of DDTs, HCHs and organophosphate metabolites in hair as well as levels of hexane and toluene in blood. Toxicol. Appl. Pharmacol. 256 (3), 399–404;

- Pamphlett, R., 2012. Exposure to environmental toxins and the risk of sporadic motor neuron disease: an expanded Australian case–control study. Eur. J. Neurol.

1.11 As said earlier, a full copy of the aforementioned important review is being provided for Committee members' consideration and therefore members will be able to see the list of such studies included in the references section. Also, the main text of the review points out under the heading *"Amyotrophic lateral sclerosis (ALS)"* that,

"Amyotrophic lateral sclerosis (ALS) ***is the nearly all common form of the motor neuron diseases characterized by degeneration of both upper and lower motor neurons****. The symptoms include rapidly progressive weakness, muscle atrophy and fasciculations, muscle spasticity, dysarthria (difficulty speaking), dysphagia (difficulty swallowing), and a decline in breathing ability. Irrespective of familial ALS which can be easily ruled out, there is no known cause for this disease but* ***many evidence-based potential risk factors have been proposed for its development where chemical exposures have been bolded (Morahan and Pamphlett, 2006; Sutedja et al., 2009). A population based case–control study conducted by McGuire and colleagues in 1997 was almost the starting point of pesticide-focused investigations in association with ALS. In that study, occupational exposure to three groups of chemicals, including solvents, metals, and pesticides in relation to the incidence of ALS was evaluated and the results showed the role of agrochemicals in most of the cases (McGuire et al., 1997). During the past decade, several reports indicated the association of ALS development with exposure to pesticides (Bonvicini et al., 2010; Doi et al., 2006; Freedman, 2001). Pesticides have reserved the most prominent role in the most of the surveys focusing on the association of environmental and occupational exposures with ALS, which have been carried out up to now, and it would not be unlikely to consider them as a risk factor for developing this neurological disorder (Johnson and Atchison, 2009; Kamel et al., 2012; Vinceti et al., 2012)****."***

1.12 The review also includes references to a considerable number of studies that have found associations between exposure to pesticides and a number of other neurodegenerative diseases including Parkinson's disease, Alzheimers, and multiple sclerosis. In relation to such neurodegenerative diseases the text of the review points out,

"It can be said that Parkinson and other neurodegenerative disorders have been most studied in cases of exposure to neurotoxic pesticides such as organophosphates, carbamates, organochlorines, pyrethroids and some other insecticides since they interfere with neurotransmission and function of ion channels in the nervous system (Costa et al., 2008)."

"Other than cancer, epigenetic alterations have increasingly been detected and investigated in neurodegenerative diseases, including Parkinson (Habibi et al., 2011), Alzheimer (Kwok, 2010), ALS (Oates and Pamphlett, 2007), and multiple sclerosis (Burrell et al., 2011). On the role of epigenetic changes in pesticide-induced neurodegenerative disorder, recently neurotoxic insecticides were found to promote apoptosis in dopaminergic neurons through hyper-acetylation of core histones H3 and H4 (Song et al., 2010)."

"Furthermore, in an ecologic study, Parron et al. (2011) showed that people living in areas with high level of pesticides usage had an elevated risk of Alzheimer's disease."

1.13 **For further detail of the review published in *Toxicology and Applied Pharmacology* on pesticide exposure and human chronic diseases see next section iv).**

1.14 I would also point out to Committee members that following the oral evidence session on the 28th November 2012, I sent the Committee clerks (in an email on 4th January 2013) a link to another recent study regarding the association between pesticides and Parkinson's disease.[1] This study was in addition to the other study regarding pesticides and Parkinson's disease that I highlighted to members during the oral evidence session on 28th Nov. 2012, and in the previous written evidence at paras 2.10, 3.9(j) and footnote 16.

iv) The important review published in *Toxicology and Applied Pharmacology* on pesticide exposure and human chronic diseases

1.15 Further to all that was set out regarding the adverse impacts of pesticides on human health in paras 2.1 to 2.19 of the UK Pesticides Campaign's written evidence to the Committee, dated 9th November 2012, and also further to the comments I made during the two oral evidence sessions to the Committee on 28th November 2012 and 6th February 2013, I am drawing members attention to the important review just published in *Toxicology and Applied Pharmacology* regarding the chronic health impacts of pesticides.

1.16 The review is entitled *"Pesticides and Human Chronic Diseases; Evidences, Mechanisms, and Perspectives"* by Sara Mostafalou and Mohammad Abdollahi at the

[1] The link that I sent to Committee clerks in an email on 4th January 2013 regarding the recent study on pesticides and Parkinson's disease is:- http://www.sciencecodex.com/pesticides_and_parkinsons_ucla_researchers_uncover_further_proof_of_a_link-104622 and information about the same study can also be seen at:- http://www.eurekalert.org/pub_releases/2013-01/uoc--pap010313.php

Department of Toxicology and Pharmacology, Faculty of Pharmacy and Pharmaceutical, Sciences Research Center, Tehran University of Medical Sciences, Tehran, Iran. As said earlier, a full copy of this important review is being provided for members' consideration.

1.17 The abstract for the review states, *"Along with the wide use of pesticides in the world, the concerns over their health impacts are rapidly growing.* ***There is a huge body of evidence*** ***on the relation between exposure to pesticides and elevated rate of chronic diseases such as different types of cancers, diabetes, neurodegenerative disorders like Parkinson, Alzheimer, and amyotrophic lateral sclerosis (ALS), birth defects, and reproductive disorders****. There is also circumstantial evidence on the association of exposure to pesticides with some other chronic diseases like respiratory problems, particularly asthma and chronic obstructive pulmonary disease (COPD), cardiovascular disease such as atherosclerosis and coronary artery disease, chronic nephropathies, autoimmune diseases like systemic lupus erythematous and rheumatoid arthritis, chronic fatigue syndrome, and aging. The common feature of chronic disorders is a disturbance in cellular homeostasis, which can be induced via pesticides' primary action like perturbation of ion channels, enzymes, receptors, etc., or can as well be mediated via pathways other than the main mechanism.* ***In this review, we present the highlighted evidence on the association of pesticide's exposure with the incidence of chronic diseases and introduce genetic damages, epigenetic modifications, endocrine disruption, mitochondrial dysfunction, oxidative stress, endoplasmic reticulum stress and unfolded protein response (UPR), impairment of ubiquitin proteasome system, and defective autophagy as the effective mechanisms of action."***

1.18 The review points out that long-term contact to pesticides can harm human life and can disturb the function of different organs in the body, including nervous, endocrine, immune, reproductive, renal, cardiovascular, and respiratory systems, and that in this regard, *"****there is mounting evidence on the link of pesticides exposure with the incidence of human chronic diseases, including cancer, Parkinson, Alzheimer, multiple sclerosis, diabetes, aging, cardiovascular and chronic kidney disease (Abdollahi et al. 2004c; De Souza et al. 2011; Mostafalou and Abdollahi 2012a).***"

1.19 The review discusses the association of pesticides exposure with the incidence of different types of human chronic diseases as well as general mechanisms of disease's process, which can be involved in pesticides-induced toxicities.

1.20 There are a vast number of references contained within this review to studies that found associations of exposure to pesticides with a wide range of chronic diseases, **and this includes numerous studies relating to residents living in the locality of pesticide sprayed fields**. There are also a number of accompanying Tables in the review including Table 1 that details pesticides associated with elevated incidence of cancer in epidemiological studies, and Table 2, the list of studies whose results implicate on the association of exposure to pesticides with incidence of chronic diseases and these include, breast cancer, prostate cancer, lung cancer, brain cancer (including childhood brain cancer), kidney cancer, colorectal cancer, testicular cancer, pancreatic cancer, esophageal cancer, stomach cancer, bladder cancer, bone cancer, non-Hodgkin's lymphoma, multiple myeloma, soft tissue sarcoma, leukaemia, and childhood leukaemia, birth defects, reproductive disorders, neuro degenerative diseases (including Parkinson's, Alzheimer's, Amyotrophic lateral sclerosis (ALS)), cardio-vascular diseases, respiratory diseases, diabetes (Type 1, 2 and gestational), chronic renal diseases, and autoimmune diseases (such as rheumatoid arthritis, and systemic lupus erythematous).

1.21 The review concludes that, taken together, the chronic diseases discussed within the review ***"are considered as the major disorders affecting public health in the 21st century"*** and that ***"the relationship between these diseases and environmental exposures, particularly pesticides, increasingly continues to strengthen."*** The review points out that *"Near to all studies carried out in the area of pesticides, and chronic diseases are categorized in the field of epidemiologic evidence or experimental investigation with mechanistic insight into the disease process."* It points out that *"Some epidemiologic studies have been debated on their uncertainty in elicitation of a definite conclusion because of some restrictions."* However, the review points out that ***"existence of more than a few dozen reports on the association of one case like brain cancer with exposure to pesticide is enough to create concern even without finding a direct link."***

1.22 The review points out that *"[a]bundance of evidence in this regard has promoted scientists to evaluate the mechanisms by which pesticides develop chronic diseases,"* and that *"several mechanisms and pathways have been clarified for pesticide-induced chronic diseases."* The review concludes that *"**the body of studies in this respect has become massive enough to consider pesticide exposure as a potential risk factor for developing chronic diseases,"*** and that ***"[c]onsidering chronic diseases as the most important***

global health problems it is time to find a <u>preventive approach</u> in association with agrochemicals by logical reducing pesticide use or pesticide dependency and find efficient alternatives."

1.23 The content and conclusions of this important review adds even further support to the evidence that the campaign I run has given to the Environmental Audit Committee members, both in the written evidence and the two oral evidence sessions, regarding the chronic adverse health impacts of pesticides. Also, the statement in the review that *"existence of more than a few dozen reports on the association of one case like brain cancer with exposure to pesticide is enough to create concern even without finding a direct link"* is notably the same point that I made during the oral evidence session on the 6th February 2013 where I pointed out that *"this is meant to be based on the risk of harm, not that harm has to have already occurred. Therefore, <u>even if there was just one or two studies or suggestions in relation to a link with pesticides</u>, which it is much further than that, there is confirmation that pesticides can cause a number of acute and chronic health effects, but <u>even if it was just based on the suggestion-"Could they be causing…?" "Could they be…?"</u>-**<u>action should be taken</u>**, <u>because it is meant to be based on the risk of harm</u>."*

1.24 Obviously the conclusions of the aforementioned important review are in addition to the conclusions of the previous 2004 pesticides literature review that I highlighted to members during the oral evidence sessions on 28th November 2012 and 6th February 2013 (that pesticides literature review had found **<u>consistent evidence</u>** linking pesticide exposure to brain, kidney, prostate and pancreatic cancer, as well as leukaemia, non-Hodgkin's lymphoma, neurological damage, Parkinson's disease and other serious illnesses and diseases), in which the authors concluded that they did **<u>not support</u>** the idea that some pesticides are safer than others, as they found that there are different health effects for different classes of pesticides **and therefore their overall message to people was to <u>avoid exposure to all pesticides whenever and wherever possible</u>**.

1.25 As I correctly highlighted at paragraphs 2.1 to 2.19 of the UK Pesticides Campaign's written evidence to the Environmental Audit Committee, dated 9th November 2012, based on the existing evidence it is now beyond dispute that pesticides **<u>can cause</u>** a wide range of both acute, and chronic, adverse effects on human health. This includes irreversible and permanent chronic effects, illnesses and diseases. As I previously pointed out, both in the written evidence and the oral evidence, the European Commission (EC) clearly

acknowledged when publishing the proposals for the new European pesticides legislation (in July 2006) that pesticides can cause various adverse effects on human health, including on the health of rural residents who are exposed to them. For example, in the EC's July 2006 document entitled *"Questions and answers on the pesticides strategy"* under the heading *"How do pesticides affect human health?"* the EC stated:

"Long term exposure to pesticides can lead to serious disturbances to the immune system, sexual disorders, cancers, sterility, birth defects, damage to the nervous system and genetic damage."

1.26 As highlighted at paragraphs 2.1 to 2.19 of the UK Pesticides Campaign's previous written evidence to the Environmental Audit Committee, the use of pesticides in agriculture has enormous external health and environmental costs in the UK every year.

1.27 The cost to the UK economy of just a few of the chronic health conditions that pesticides can cause is massive. **Obviously it goes without saying that the personal and human costs to those suffering chronic diseases and damage cannot be calculated in financial terms.** The significance of these consequences requires the adoption of a **preventative approach** to make sure that the protection of human health ***is*** (which it currently is ***not***) the overriding priority of the UK Government's policy and regulations.

1.28 The UK Pesticides Campaign has always argued from the outset of the campaign that the existing substantial health and environmental costs in relation to the use of pesticides ***far outweighs*** the cost of switching to non-chemical forms of agricultural production that do not depend on pesticides. **The Government is not factoring in this fundamental point in its policy decisions on pesticides.**

v) Additional comments on specific points

1.29 I would like to take the opportunity in this further written evidence to provide additional comments on a number of specific points.

1) Reports of acute and chronic adverse health impacts

1.30 Firstly, as I pointed out in both the written evidence dated 9th November 2012, and during the oral evidence sessions on 28th November 2012 and 6th February 2013, for the last 11 years the UK Pesticides Campaign has received reports of both acute adverse health effects, as well as chronic long-term effects, illnesses and diseases, in rural

communities where residents live in the locality of pesticide sprayed fields. The **acute effects** reported are the same types of acute effects recorded in the Government's very own monitoring system and include, sore throats, burning eyes, nose, skin, blisters, headaches, dizziness, nausea, stomach pains, burnt vocal chords and flu-type illnesses, amongst other things. The most common **chronic long-term illnesses and diseases** reported include various cancers, (especially breast cancer among rural women, as well as cancers of the prostate, stomach, bowel, brain, and skin), leukaemia, non-Hodgkins lymphoma, neurological conditions, (including Parkinson's disease, Multiple Sclerosis (MS) and Myalgic Encephalomyelitis (ME)), asthma, allergies, along with many other medical conditions. The reports of adverse health effects cover all different age groups from the very young (including babies and young children) to the elderly.

1.31 It is important that I stress again the critical fact that there are a number of cases where the individuals involved **do have** confirmation from either their doctor (or other medical professional) that the acute and/or chronic effects **are caused** by pesticides. This is especially the case when the chronic effects are related to irreversible neurological damage and injury.

1.32 As I pointed out during the oral evidence session on 6th February 2013 the reports of adverse health impacts that the campaign I run has received from residents all over the UK over the last 11 years are all **medically diagnosed confirmed physical conditions**, and therefore it would not only be seriously erroneous and clearly wholly inappropriate for anyone to try to suggest that such conditions are *"psychosomatic"* or *"imagined"* or *"all in the mind,"* but any suggestions of this nature would be quite frankly grossly insulting, disrespectful, and patronizing to anyone who has suffered acute and/or chronic adverse health impacts as a result of exposure to pesticides sprayed in their localities.

1.33 As I said during the oral evidence session on 6th February 2013, the conditions that are being reported by residents living in the locality of pesticide sprayed fields are the same conditions as those that the European Commission has previously **acknowledged** in its statements in 2006 **can be caused** as a result of exposure to pesticides, especially exposure over the long term, such as is the case for residents and rural communities.

1.34 Therefore as said during the oral evidence session on 6th February 2013, those suffering such health conditions have every right to know if pesticides have been the

cause of their health problems, and also those that may not yet have suffered any health problems, have every right to know the information necessary to make informed and knowledgeable decisions to be able to try and protect their health and the health of their family from any harm. **However, obviously the fundamental point is that people should have the right not to be exposed to these chemicals at all in the first place.**

1.35 I would stress again the fact that European legislation **requires** that pesticides can only be authorised for use in the first place if it has been **established** (under Article 4 duty) that there will be **no harmful effect on human health**. That applies to both acute and chronic adverse health effects. Thus the principle aim of pesticide policy and legislation under the European legislation is supposed to be based on the **risk of harm and not that harm has to have already occurred.** Therefore the UK Government should **not** be exposing people to any risk of either acute or chronic harm to health.

1.36 Yet, as I have continued to point out since the outset of the campaign, considering the serious failings of the current UK policy and approvals system for protecting residents from pesticides, (including in relation to the fact that, to date, there has never been any assessment of the risks to health for the long term exposure of residents; as well as the serious inadequacies of the UK Government's existing monitoring system, including that it does not even deal with chronic effects at all), then I reiterate the critical fact that under European legislation **pesticides should never have been approved for use in the first place for spraying in the locality of residents' homes, schools, children's playgrounds, and other areas where members of the public may be present**.

1.37 I would also point out that there is also a clear case of double standards here. For example, the Government's response to the threat of a chemical terrorist attack would be first and foremost to protect its citizens. However, the spraying of toxic pesticides all over the countryside and the poisoning of the public is directly under Government sanction.

1.38 As pointed out at paragraph 7.8 of the previous written evidence to the Committee, the factual evidence clearly confirms the fact that in relation to the exposure of residents **more than enough evidence already exists** (evidence of AOEL exceedances; harm to the health of residents and others exposed, including in the UK Government's *own monitoring system* etc.) **for action to be taken now** with the introduction of mandatory measures for the protection of residents health, and that are very, very long overdue.

2) UK National Action Plan for Pesticides

1.39 During the oral evidence session on 27th February 2013 with DEFRA Minister Lord de Mauley, DEFRA Chief Scientific Advisor Professor Ian Boyd, and Dave Bench from CRD, there was some discussion of the UK Government's National Action Plan (NAP) on pesticides which had been published the day before on 26th February 2013.

1.40 In relation to this I would make the following few points regarding the UK's NAP.

1.41 I noted that the Committee members sought clarification from the aforementioned witnesses as to what exactly had changed between the previous draft of the NAP and the version published on 26th February 2013. Dave Bench confirmed that nothing substantial had changed. Having checked the two versions, there is certainly no noticeable changes in any of the substance of the final version of the Government's NAP with the previous draft

1.42 Therefore, as per with previous Government consultations on pesticides, the Government "consults," but then just goes and does what it fully intended to do in the first place. This is not particularly surprising, as it has happened in every single Government "consultation" on pesticides over the last 10 years.

1.43 As I pointed out at paragraph 5.5 of the previous written evidence to the Committee, dated 9th November 2012, by CRD carrying out all the Government Consultations' on pesticides, and also being the main Government agency that assesses the adequacy of the UK's policy and approach, is really effectively just asking the regulator to be judge and jury of itself, which further compounds the inappropriateness of the UK structure.

1.44 Regulation 4 of the UK *"Plant Protection Products (Sustainable Use) Regulations 2012"* requires the Secretary of State, the Scottish Ministers and the Department to jointly adopt a National Action Plan in accordance with Article 4 (of the EU Sustainable Use Directive (SUD)) and to revise it as necessary. The NAP is supposed to include the provisions listed from Article 5 to Article 15 of the European Sustainable Use Directive. (See paragraph 2 of the Impact Assessment that accompanied *"The Plant Protection Products (Sustainable Use) Regulations 2012"* that states, *"Article 4 states that the Member States' National Action Plans shall describe how they will* ***implement the measures necessary to implement the Directive's requirements/aims****."*)

1.45 The UK NAP is mainly based on voluntary measures *only* and does not currently contain anything that would actually result in reducing the risks and adverse impacts of pesticide use on human health, **especially not in relation to agricultural pesticide use**. **This is despite the fact that the main purpose of the EU SUD is for reducing the risks and impacts of pesticide use on human health and the environment!** For example, paragraph 14.2 of the NAP refers to *"a range of industry initiatives to protect **health** and the environment."* Such industry initiatives are voluntary based only, for example the Voluntary Imitative (VI). Further, **the VI is only related to the environment**[2] **and does not focus on health.** Considering the Government has not, to date, properly recognised the risks and adverse impacts on human health from exposure to agricultural pesticides from crop spraying (especially in relation to residents) then there is no real surprise that the Government has not proposed **any** mandatory measures to reduce the risks and adverse health impacts from the use of pesticides in agriculture. (For example, the NAP merely maintains, as ever, (at paragraph 7.1) that *"The regulatory risk assessment and risk management process **is very effective at identifying and mitigating risk**"*).

1.46 As I detailed in the previous written evidence to the Committee, dated 9th November 2012, the reliance on existing or enhanced voluntary approaches will not change anything, and thus will not provide any public health protection, as voluntary measures have existed for decades, have not worked, however many times they are repackaged, and are completely unacceptable in this situation.

1.47 There are further examples in the UK NAP where the focus and concern is on reducing the *alleged* burdens on farmers, industry and other related business. (For example, amongst others, paragraph 5.2 that states, *"The Government is keen to ensure that regulatory burdens on businesses are kept to a minimum and reduced/removed wherever possible. For pesticides, this means that the Plan aims for non-regulatory approaches to be adopted as much as possible, and looks to stakeholder partners to deliver these. Of particular relevance in delivering the non-regulatory measures in the Plan are the two key stakeholder organisations, the Voluntary Initiative for pesticides for agriculture and horticulture, and the Amenity Forum.*")

[2] For example, the VI website states, "*In 2001 the Government accepted proposals put forward by the farming and crop protection industry to minimise the **environmental** impacts from pesticides."*

1.48 Other examples of this can also be seen in other recent Government documentation relating to the EU SUD, for example in paragraph 11.2 of the Explanatory Memorandum that accompanied the *"The Plant Protection Products (Sustainable Use) Regulations 2012"* it states that, *"**All decisions have been taken with a view to minimising the effect on these businesses, including approaches such as; - adopting a "business as usual" policy where possible taking into account the requirements of the Directive**, and attempting to replicate the existing regime as far as possible; - including a requirement that people take "reasonable precautions" **rather than introducing certain prescriptive new measures, allowing businesses the flexibility to decide what measures are necessary based on individual circumstances, rather than a need for familiarisation with a raft of complex requirements**; - **using all available derogations**; - deeming existing UK requirements as satisfying equivalent or related requirements under the Directive wherever possible, **so that businesses do not have to implement unnecessary changes** (for example, existing training certificates will be deemed to meet the minimum requirements of those introduced under the Directive)."*

1.49 The Government's position is, as ever, mainly concerned with the *alleged* impacts and burdens, (including costs) that the obligations of the new EU legislation may have on farmers, industry and other related business. Yet the Government's policy on pesticides is supposed to protect human health first and foremost. Business and industry interests must not come before public health and safety. What about the real-life adverse impacts and burdens on rural residents and communities (and other members of the public) from crop-spraying activities, which includes impacts not only on their health, but also on their environment, as well as related costs and other financial implications for residents etc.

1.50 It is noticeable that there is no reference **anywhere** in the UK NAP to the existing **real-life adverse health and environmental impacts and burdens on residents and communities (and the public in general) from crop-spraying activities, which again, means that there is also no recognition or inclusion of the related costs and other financial implications for residents from *not* introducing the necessary mandatory measures for the protection of residents.** The protection of human health is of far greater value and importance than the protection of industry finances and, as pointed out previously, public health protection is supposed to be the Government's main priority and concern in its pesticides policy and approach, and which, to date, it clearly has not been.

1.51 I would also add at this juncture that the Government's response in the National Action Plan regarding Article 12 of the EU Sustainable Use Directive is factually and legally incorrect. I have repeatedly previously pointed this out to CRD and DEFRA in previous DEFRA consultations and yet officials continue to seemingly intentionally misinterpret the requirements of Article 12 of the SUD. Further, it is completely inaccurate for DEFRA/CRD to state in the Summary of NAP Consultation Responses that *"residents who live adjacent to agricultural areas are **not** subject to high pesticide exposure"* as Article 3 paragraph 14 of the EU PPP Regulation **specifically defines residents living in the locality of pesticide sprayed fields as being "*subject to high pesticide exposure over the long term.*"** The recognition of the high level of exposure to pesticides for residents can also be seen elsewhere in the EU SUD such as in Article 7(2) that puts residents alongside operators and agricultural workers in terms of the high level of exposure to pesticides of the 3 exposure groups. However, it should be reiterated again that unlike operators, residents will not be expected to have any protective clothing and/or use any mitigating measures to prevent exposure to pesticides used/sprayed on crop fields in their localities. This is why, as said previously, the UK Pesticides Campaign has continued to correctly point out that residents are a group with one of the highest levels of exposure to pesticides. Therefore the blatant denial by DEFRA/CRD in the Summary of NAP Consultation Responses of the factual and realistic exposure scenario for residents (ie. that the exposure is high) is outrageous.

1.52 If members require any further information regarding Article 12 of the European Sustainable Use Directive and the Government's misinterpretation of the requirements of Article 12, then the UK Pesticides Campaign's submission to the DEFRA Consultation on the UK National Action Plan can be provided to Committee members on request.

3) No balancing of interests when it comes to public health protection

1.53 During the oral evidence session on 27th February 2013 with DEFRA Minister Lord de Mauley, DEFRA Chief Scientific Advisor Professor Ian Boyd, and Dave Bench from CRD, from my recollection Martin Caton MP questioned whether the Government was in fact supposed to be considering the impact on agro-chemical companies when making decisions on pesticides and cited statements from the European pesticides legislation.

1.54 In relation to this I would make the following few points.

1.55 The fundamental concern of the former European Directive 91/414 regarding the authorization of pesticides was that human health must not be at risk of harm. Recital 9 of Directive 91/414 stated, *"Whereas the provisions governing authorization must ensure a high standard of protection, which, in particular, must prevent the authorization of plant protection products whose risks to health, groundwater and the environment and human and animal health should take priority over the objective of improving plant production."*

1.56 This is also reflected in the new PPP Regulation that has replaced 91/414, as there are a number of places within the text of the new PPP Regulation that explicitly state that the overriding primary objective of the PPP Regulation is the high level of protection of human health and the environment. For example, recital 24 states, *"The provisions governing authorisation must ensure a high standard of protection. In particular, when granting authorisations of plant protection products, the objective of protecting human and animal health and the environment should take priority over the objective of improving plant production. Therefore, it should be demonstrated, before plant protection products are placed on the market, that they present a clear benefit for plant production and do not have any harmful effect on human or animal health, including that of vulnerable groups, or any unacceptable effects on the environment."* Article 1, paragraph 4 of the PPP Regulation states, *"The provisions of this Regulation are underpinned by the precautionary principle in order to ensure that active substances or products placed on the market do not adversely affect human or animal health or the environment. In particular, Member States shall not be prevented from applying the precautionary principle where there is scientific uncertainty as to the risks with regard to human or animal health or the environment posed by the plant protection products to be authorised in their territory*."

1.57 The EU SUD is also clear that the protection of human health and the environment is the priority. For example, Recital 22 states, *"the objective of this Directive"* is *"namely to protect human health and the environment from possible risks associated with the use of pesticides."* Recital 1 requires account to be taken of both precautionary and **preventive approaches**. Article 2, paragraph 3 of the SUD states that, *"The provisions of this Directive shall not prevent Member States from applying the precautionary principle in restricting or prohibiting the use of pesticides in specific circumstances or areas."*

1.58 It is therefore clear from the text of both the former European Directive 91/414 and the new European legislation consisting of the PPP Regulation and the SUD that the overriding primary objective of the EU pesticides legislation is the high level of protection of human health and the environment. It is also therefore clear that under European legislation there should be no balancing of interests as the protection of human health and the environment is supposed to be paramount.

1.59 Yet the Government has for many years now based its policy decisions regarding pesticides on the *alleged* financial and economic impacts on manufacturers, farmers and distributors, or the impact on agricultural productivity, if there were any changes to the current UK policy and approach for pesticides and the related approvals system.

1.60 The Government has continued to adopt the improper approach of *balancing* harm from pesticides against the (supposed) benefits of pesticide use, in which the Government is accepting a degree of damage on the basis that *it believes* it is outweighed by other benefits (eg. cost/economic benefits for farmers and the industry), rather than on the absolute protective approach that is required for health and environmental protection.

1.61 As detailed above, it is clear there can no balancing approach in a legal framework such as this, as the protection of human health and the environment must be paramount.

1.62 I would also point out that there is currently a clear mismatch and inconsistency between the Government's longstanding failure to protect people from passive exposure to pesticides and the Government's approach in other comparable policy areas that ended in a ban for public health protection. For example, the smoking ban in public places; BSE; asbestos and straw-burning, to name but a few. The latter, straw-burning, is a very good example of: a) the vociferous objection from the industry of any legislature measures being introduced, (which has always been the same sort of industry objection in relation to any measures being introduced regarding pesticides); and b) how inadequate measures, such as small buffer zones, as well as *voluntary* approaches, (however many times they are repackaged) failed to protect residents and communities. The industry (led by the NFU) claimed that it would damage farming if a ban on straw-burning came in, yet there was no apparent harm to the industry following the introduction of the legislation.

1.63 As said at paragraphs 7.10 to 7.18 of the UK Pesticides Campaign's previous written evidence to the Committee, the only real solution to eliminate the adverse health and

environmental impacts of pesticides is to take a preventative approach and avoid exposure altogether with the widespread adoption of truly sustainable non-chemical farming methods. This would obviously be more in line with the objectives for sustainable crop production, as the reliance on complex chemicals designed to kill plants, insects or other forms of life, cannot be classified as sustainable. **Therefore it is a complete paradigm shift that is needed, as no toxic chemicals that have related risks and adverse effects for any species (whether humans, bees or other) should be used to grow food.**

1.64 During the oral evidence session on 27th February 2013 with DEFRA Minister Lord de Mauley, DEFRA Chief Scientific Advisor Professor Ian Boyd, and Dave Bench from CRD, I noted there was some discussion regarding Integrated Pest Management (IPM).

1.65 I would therefore reiterate the points made at paragraphs 7.15 to 7.17 of the UK Pesticides Campaign's previous written evidence to the Committee, in that Integrated Pest Management (IPM) is obviously **not** the same as non-chemical methods, as IPM is a system that still uses pesticides to some degree (whichever definition one goes by). Therefore in *reality*, and in practice, IPM does not necessarily involve lower pesticide use, and thus the IPM system is not going to fundamentally change anything as it is not a move away from the use of pesticides in agriculture. IPM is a red herring and is a weaker, far more compromised system than utilising complete non-chemical farming systems.

1.66 According to Peter Melchett, Policy Director of the Soil Association, in a previous exchange I had with him regarding IPM, IPM is really current conventional farming, as many conventional farmers insist they already use IPM. I note that the Minister, Lord De Mauley, also pointed this out during the oral evidence session on the 27th February 2013.

1.67 Therefore the problems with pesticides will not be solved by IPM. As said, it is a complete paradigm shift that is needed to shift policy away from the dependence on pesticides altogether.

1.68 In objection to the widespread adoption of non-chemical methods the UK Government and the chemical and farming industries have repeatedly argued over the years that there would be a vast reduction in yield if pesticides were not used. Yet there are various international studies that have shown that this would not necessarily be the case and a few examples of these include:

- One review of over 200 food production projects involving simple, organic type techniques in different countries found that they resulted in **major yield increases, ranging from 46-150%**[3]

- Other case studies in the Philippines have demonstrated that sustainable agriculture can be practised in large scale; where yields do not necessarily drop without the use of chemical fertilisers and pesticides; **and that a rapid (even immediate) transition from chemical farming to sustainable agriculture is possible if correct technical principles are followed**

- One 15-year study comparing non-chemical farming methods to conventional methods concluded that yields from non-chemical farming equal conventional yields after four years. **And that's with no detriment to soil, water or human health**[4]

- A previous study published results of 205 comparisons made of yields from organic and conventional farming systems in north America and Europe. The major finding of the study was, on average, and for a wide range of crops, yields within 10 percent (90 percent) of those obtained in conventional agriculture were achieved **without use of agro-chemicals** [5]

- Ethiopia has also been turning away from high-input, intensive agriculture to develop farming systems based on traditional and organic farming methods. It has been reported that the results have been impressive, with yields doubling, in some cases more, following the use of compost – yields of the common Faba bean increased five-fold from 500 kg/ha to 2,500 kg/ha. **The practical evidence of Project Tigray's increased yields has convinced the Ethiopian Government to abandon agrochemical-reliant agriculture and reorient national food and farming policy towards organic farming**

- Another report found that organic and agro-ecological farming in the Southern hemisphere produces dramatic yield increases, as well as greater crop diversity and greater nutritional content. For example: Tigray, Ethiopia (composted plots yield 3-5 times more than chemically treated plots), Brazil (maize yields increased 20-**250%);** and Peru (increases of 150% for a range of upland crops) [6]

- A study in Africa also showed an increase in yields from using organic and non-chemical methods. The article stated, *"The research conducted by the UN Environment Programme suggests that organic, small-scale farming* ***<u>can deliver the increased yields</u>*** *which were thought to be the preserve of industrial farming,* ***<u>without the environmental and social damage which that form of agriculture brings with it</u>****. An analysis of 114 projects in 24 African countries found that yields had more than doubled where organic, or near-organic practices had been used. That increase in yield jumped to 128 per cent in east Africa."* [7]

- Researchers in Denmark found that a large-scale shift to organic agriculture could actually help fight world hunger while improving the environment. [8]

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[3] Source: *"Reducing Food Poverty with sustainable agriculture: A Summary of New Evidence," 'SAFE-World' Research Project.* J.N. Pretty and Rachel Hine, 2000.
[4] Source: Rodale Institute of Kutztown, Pennsylvania, 1998.
[5] Source: G. Stanhill, 1989.
[6] Source: *"The Real Green Revolution – Organic and agro-ecological farming in the South,"* N. Parrott and T. Marsden, Greenpeace, 2002.
[7] Source: http://www.independent.co.uk/news/world/africa/organic-farming-could-feed-africa-968641.html
[8] Source: *"Organic agriculture and food security,"* Mark W. Rosegrant, Timothy B. Sulser, and Niels Halberg, 2007.

1.69 These examples undermine the suggestion that non-chemical methods would necessarily result in a decrease in yields, and in fact a number of the aforementioned studies actually found a significant *increase* in yield. What such methods would do is to eliminate the very significant health and environmental costs that currently exist in relation to the use of pesticides, (as well as eliminating the financial costs of the farmer or pesticide user having to buy the chemicals in the first place). This would result in significant economic and financial benefits and it is the only real solution to protect public health and prevent any illnesses and diseases associated with pesticides, for now and for future generations, especially in relation to residents (who, as detailed earlier, are one of the highest exposure groups when it comes to agricultural pesticide spraying).

1.70 Considering the risks, and acute and chronic adverse health impacts of pesticide use, then a **preventative approach** must be utilized, especially in relation to the protection of vulnerable groups including residents, babies, children, the elderly, and those already ill.

1.71 It is important to point out that there does not appear to be anything in particular in the UK NAP regarding the use of non-chemical alternatives, particularly not in relation to agriculture. This is despite the fact that one of the main objectives/aims of the new EU legislation from the outset under the Thematic Strategy is to shift policy towards the utilisation of non-chemical farming methods **by promoting and encouraging use of non-chemical methods in order to reduce dependency on pesticides**.

1.72 Therefore the Government needs to prioritise non-chemical methods in the UK's NAP, as there should be a section specifically within the NAP to take forward the objective/aim within the EU legislation of promoting and encouraging the utilisation of non-chemical methods in order to reduce dependency on the use of pesticides in the UK.

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