Rural Development and Food Security Forum 2019 – List of Resources
Session 2: Dysfunctional Agriculture Markets

The session discusses the impacts of dysfunctional agricultural markets on profits, farm productivity, food quality, high prices for consumers, and malnutrition.

Title and Link	Overview
1. How to Cope with Largely Dysfunctional Market Signals for Soil Stewardship	For decades, many scholars have pointed to the need for internalization of social and environmental costs and compensation for ecosystem services as the silver bullet for overcoming market failure and thus ill-conceived economic incentives for farmers. There are a number of examples of national programs for compensating farmers for generating environmental services, but their results are mixed and potential systemic problems underestimated.
2. Report brands farm and food industries 'dysfunctional'	A government-commissioned report intended to point a way forward for the food and farming industries after foot and mouth and recent health scares said today that both are "unsustainable".
3. Contrasting Food Corporations and Economics with Peasant Farmers and Sustainability	Peter Senker contrasts the current role of multinational food corporations with peasant farmers and contemporary efforts to consider human health and environmental sustainability in the food system. Peter presents a discord between economically-driven food production and marketing industries and small-scale farmers and independent retailers.
4. Focus on 'dysfunctional' agriculture markets urges as farm incomes declines	The Rural Affairs Secretary of Scotland has called for a greater focus on "dysfunctional" agriculture markets after farm incomes halved in four years despite reasonable weather and increasing production.
5. How the state and the market failed farmers	Farmers continue to be vulnerable to frequent episodes of losses that neither the state nor the markets have been able to mitigate.

Title and Link	Overview
6. Thai Scientists Use Stable Isotopes to Improve Food Labelling and Nutrition Programmes	Thai consumers will soon have access to more precise nutrition labelling on food products and recommendations on nutrient intake, thanks in part to scientific data collected using stable isotope techniques.
7. Viet Nam Enhances Food Quality Using Irradiation	Food irradiation in Ho Chi Minh will ensure that the root vegetables and fruits do not sprout or ripen prematurely; that parasites are killed and spices are decontaminated; that salmonella are destroyed and that fungi that could spoil meat, poultry and seafood is eliminated.
8. IAEA Technical Cooperation in Asia and the Pacific	This brochure provides an overview of the Technical Cooperation programme in Asia and the Pacific, highlighting successful projects in the region that have contributed positively to the region's development plans. It also describes important initiatives in south-south cooperation and in enhancing capacity building in nuclear science and technology, especially in future generations.
9. Bangladesh Triples Rice Production with Help of Nuclear Science	New varieties of rice made using nuclear techniques have helped Bangladesh increase its rice production three-fold in the last few decades. This in turn has enabled the country to stay one step ahead of its rapid population growth.
10. Indonesia Selects Nuclear-bred Soybean Variety for Mass Production	Indonesia's Ministry of Agriculture last month selected an improved soybean variety developed using nuclear techniques as the basis for its national self-sufficiency plan, which aims to increase food security in the country.
11. How Nuclear Techniques Help Feed China	China's agricultural scientists have made growing use of nuclear and isotopic techniques in crop production over the last decades. In cooperation with the IAEA and the Food and Agriculture Organization of the United Nations (FAO), they are now helping experts from Asia and beyond in the development of new crop varieties, using irradiation.
12. Irradiated Fruit Flies: the Secret to Protecting Thailand's Premium Fruit Exports	Five million irradiated fruit flies burst out of white boxes every Saturday and race to stop female flies from breeding larvae-filled eggs in Trok Nong, a small rural town in eastern Thailand. Their mission: protect premium export fruits like durian and mangosteen. Thanks in part to these swarms of flies produced with the sterile insect technique (SIT),

Title and Link	Overview
	farmers in Chanthaburi province now have a steady supply of fruit for lucrative export markets.
13. Vietnamese Authorities Control Spread of African Swine Fever with the Use of Nuclear-derived Techniques	The research team of the National Centre for Veterinary Diagnosis has been using training and equipment obtained through IAEA support, in collaboration with FAO, to rapidly diagnose diseases like African Swine Fever with nuclear-derived and other techniques, controlling their spread and protecting the country's livestock industry and food security.

PDF FILES

Title and Link	Overview
15. Bangladesh's story of change in nutrition: Strong improvements in basic and underlying determinants with an unfinished agenda for direct community level support	Bangladesh has made considerable progress in reducing child stunting and is lauded as a success story in global nutrition fora. This mixed-methods study considers available statistical and qualitative evidence to help reveal the critical factors behind Bangladesh's 'story of change' in nutrition. Much of the improvement in nutrition in Bangladesh in recent years is explained by what can be seen as nutrition-sensitive drivers within a wider enabling environment of pro-poor economic growth. Key amongst these factors have been improving incomes; smaller family sizes and greater gaps between births; parental - and particularly women's - education and wider health access. Research and interviews with key stakeholders and work at a community level has helped shed light on the policy and programmatic choices which lie behind these wider determinants. Community based nutrition programmes have not yet been operating at scale as in other countries and the current governance arrangements for nutrition delivery are weak. But as Bangladesh faces growing new nutritional problems and still suffers from a relatively high burden of child stunting, such 'nutrition-specific' programmes will have to play a greater role than in the past, as the further gains from some of these wider drivers may be limited and are likely to have plateaued.
16. The Economics of the Brazilian Model of Agricultural Development	This paper analyzes the transformation of Brazilian agriculture from a backward and dysfunctional sector to one of the breadbaskets of the world, focusing on those elements that might carry over to other developing

Title and Link	Overview
	countries seeking to make a similar transition. Today, Brazil is one of the major producers of a series of agricultural commodities, such as soybeans, sugar, orange juice, maize, cotton, chicken, meat and pigs, with strong participation in a long list of others. This has been achieved not by simply incorporating more land but by dramatic improvements in productivity, led by technological research that developed methods and inputs specifically suited to the country's conditions.
17. Zero Hunger – A work in progress (PowerPoint)	Global food production has continued to grow allowing us to meet global demand. But it has come at an environmental cost. Sustaining progress towards hunger reduction will require sustainable intensification.
18. Agricultural factor markets in Sub-Saharan Africa: An updated view with formal tests for market failure	This paper uses the recently collected Living Standard Measurement Study–Integrated Surveys on Agriculture Initiative data sets from five countries in Sub-Saharan Africa to provide a comprehensive overview of factor market participation by agrarian households and to formally test for failures in rural markets. Under complete and competitive markets, households can solve their consumption and production problems separately, so that household factor endowments do not predict input demand. This paper implements a simple, theoretically grounded test of this separation hypothesis, which can be interpreted as a reduced form test of market failure.
19. Does women's time in domestic work and agriculture affect women's and children's dietary diversity? Evidence from Bangladesh, Nepal, Cambodia, Ghana, and Mozambique	This paper examines the relationship between women's time spent in domestic work and agriculture and women's and children's dietary diversity. Using data from Bangladesh, Nepal, Cambodia, Ghana, and Mozambique, we find that women's domestic work and cooking time are positively correlated with more diverse diets. We also find differential effects depending on asset poverty status.
20. Explaining the reduction in child undernutrition in the Indian state of Maharashtra between 2006 and 2012: An analysis of the policy processes	This study is intended to contribute to future policy via unpacking the unfolding story of policy and programme attention to nutrition. Stakeholder perceptions and opinions on the wider policy, political and contextual reasons for Maharashtra's decline in child undernutrition were sought and used alongside documentary evidence to construct a chronology of key events. Key factors identified via this process include the way in which issue framing and

Title and Link	Overview
	evidence helped catalyse a political response; the particular governance structures employed in response (the State's 'Nutrition Mission') and the way in which leadership and a focus on system-wide capacity combined in an innovative fashion to focus resources on pockets of deprivation in high-burden areas.
21. The State of Agricultural Commodity Markets: Agricultural Trade, Climate Change, and Food Security	This edition of The State of Agricultural Commodity Markets focuses on the complex and underexplored intersection between agricultural trade, climate change and food security. It is clear that we cannot tackle hunger without finding adaptation and mitigation solutions to climate change in agriculture and food systems. It is also clear that the uneven impact of climate change across regions and countries, and the corresponding changes in food availability and access will affect international trade patterns and trade routes. This report supports these discussions by providing an in-depth analysis of the Paris Agreement and the WTO agreements to enhance clarity and provide guidance on policy options that could strengthen the mutually supportive role of these accords in tackling climate change and hunger.
22. Global Hunger Index: Forced Migration and Hunger 2018	The 2018 Global Hunger Index—published jointly by Concern Worldwide and Welthungerhilfe—tracks the state of hunger worldwide and spotlights those places where action to address hunger is most urgently needed. The results show that in many countries, and in terms of the global average, hunger and undernutrition have declined since 2000, indicating real improvements in the lives of millions of men, women, and children. At the same time, while progress has been robust in some parts of the world, in other parts hunger and undernutrition persist or have even worsened. In too many areas, growing numbers of people still suffer the indignity of hunger and the insecurity of forced displacement.
23. Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017	Suboptimal diet is an important preventable risk factor for non-communicable diseases (NCDs); however, its impact on the burden of NCDs has not been systematically evaluated. This study aimed to evaluate the consumption of major foods and nutrients across 195 countries and to quantify the impact of their suboptimal intake on NCD mortality and morbidity.

Title and Link	Overview
24. Heavy metals in food crops: Health risks, fate, mechanisms, and management	This review focuses on and describes heavy metal contamination in soil–food crop subsystems with respect to human health risks. It also explores the possible geographical pathways of heavy metals in such subsystems. In-depth discussion is further offered on physiological/molecular translocation mechanisms involved in the uptake of metallic contaminants inside food crops. Finally, management strategies are proposed to regain sustainability in soil–food subsystems.
25. How can we feed the world without pressuring the environment?	We conducted a scenario analysis using a computer simulation model called GLOBIOM. The results of this study showed that if we simply increase food production without improving food distribution to fight hunger, 20% more food production will be required in 2030 than the business-as-usual scenario, expanding 48 Mha of agricultural land and increasing greenhouse gas emissions by 550 Mt CO2eq/year. On the other hand, if hunger eradication efforts target the undernourished while also reducing food waste and over-consumption especially in developed countries, food production will be reduced by about 9% of the business-as-usual scenario, and the environmental impact can be greatly reduced. To fight hunger without pressuring the environment, our results suggest that it is a key to not only increase food production, but also improve food distribution, especially food support for hunger people, reduction of food waste and over-consumption.
26. How Senegal created an enabling environment for nutrition: A story of change	In the past 15 years, Senegal has made considerable progress in the fight against child undernutrition. To better understand how this was achieved, we reviewed 11 national policy documents published between 2001 and 2015, and interviewed 25 key-informants from the government, donor community, civil society, as well as 24 local service providers and 18 community members. We explored the commitment of actors and coherence between and within sectors. We linked this to changes in nutrition services experienced by communities. The key theme that emerged was the critical role of increased political commitment, materialized and maintained by a high-level national coordinating body for nutrition. The body actively facilitates multisectoral coherence in action for nutrition, overseeing the implementation of a national

Title and Link	Overview
	nutrition program, the effects of which are seen at the community level.
27. Occurrence and human health implications of chemical contaminants in vegetables grown in peri-urban agriculture	Recent studies have proven that vegetables cultivated in peri-urban areas are exposed to a greater concentration of organic microcontaminants (OMCs) and trace elements (TEs) than those grown in rural areas. In this study, the occurrence and human health risk of chemical contaminants (16 TEs and 33 OMCs) in edible parts of lettuce, tomato, cauliflower, and broad beans from two farm fields in the peri-urban area of the city of Barcelona and one rural site outside the peri-urban area were assessed.
28. IFPRI Global Food Policy Report 2019	IFPRI's flagship report reviews the major food policy issues, developments, and decisions of 2018, and considers challenges and opportunities for 2019. This year's Global Food Policy Report highlights the urgency of rural revitalization to address a growing crisis in rural areas. Rural people around the world continue to struggle with food insecurity, persistent poverty and inequality, and environmental degradation. Policies, institutions, and investments that take advantage of new opportunities and technologies, increase access to basic services, create more and better rural jobs, foster gender equality, and restore the environment can make rural areas vibrant and healthy places to live and work. Drawing on recent findings, IFPRI researchers and other distinguished food policy experts consider critical aspects of rural revitalization.
29. IFPRI Global Food Policy Report 2019: Central Asia	Food security in Central Asia continues to be largely shaped by international commodity markets and developments in the region's major trading partners. Nevertheless, recent political events in the region had a positive impact on overall economic development as well as on food and nutrition security by stimulating intraregional trade and integration.
30. Why is Asia so food insecure?	One in nine people around the world are hungry—a total of 821 million people worldwide. But global food security is actually improving, with over 70 per cent of countries strengthening their scores in this year's Global Food Security Index (GFSI). Only two countries from Asia Pacific—Singapore and Australia—feature in a global

Title and Link	Overview
	ranking of food security. How can the world's most populous region improve food security?
31. Rising Atmospheric CO2 Lowers Concentrations of Plant Carotenoids Essential to Human Health: A Meta-Analysis	Plant and human tissues (e.g., leaves, retina) share the need for carotenoids to protect against light-induced and other oxidative stresses. While plants synthesize carotenoids de novo, humans must obtain them primarily through plant-based foods. In plants, elevated levels of atmospheric carbon dioxide (eCO2) decrease the concentrations of essential minerals, including magnesium and zinc (essential for brain and eye health), but the overall effect of globally rising CO2 levels on carotenoids is unknown. Here, investigation is sought on how eCO2 affects carotenoids in plants. A meta-analysis of 1026 experimental observations from 37 studies shows that eCO2 decreases plant carotenoid concentrations by 15% (95% CI: −26% to −6%). The meta-analysis of available gene expression data for Arabidopsis thaliana points to a potential CO2-induced downregulation of carotenoid biosynthesis (Log2 fold-change −13%, 95% CI: −17% to −9%). Some other stoichiometric and biochemical mechanisms related to CO2-induced changes in carotenoids are also highlighted. While overall eCO2 decreases carotenoid concentrations, individual CO2 studies report variable responses, including increases in carotenoid levels, especially in abiotically stressed plants. The initial assessment raises a novel question about the potential effects of rising CO2 on human health through its global effect on plant carotenoids.
32. Levels and Trends In Child Malnutrition (brochure)	The inter-agency team released new joint estimates for child stunting, overweight, underweight, wasting and severe wasting (March 2019 edition) using the same methodology as in previous years. These new estimates supersede former analyses results published by UNICEF, WHO and the World Bank Group. Note the entire time series is updated; for assessing changes over time, comparisons should be made based on the update time series. Given that country data are at maximum available from surveys conducted in the year previous to when the modelling exercise takes place, in 2019 the joint estimates

Title and Link	Overview
	were derived up to 2018 with extrapolation for stunting until 2030.
33. Levels and Trends in Child Malnutrition (report): UNICEF / WHO / World Bank Group Joint Child Malnutrition Estimates - Key findings of the 2018 edition	UNICEF, WHO, World Bank global and regional child malnutrition estimates reveal that we are still far from a world without malnutrition. The joint estimates, published in May 2018, cover indicators of stunting, wasting, severe wasting and overweight among children under 5, and reveal insufficient progress to reach the World Health Assembly targets set for 2025 and the Sustainable Development Goals set for 2030.Improving children's nutrition requires effective and sustained multi-sectoral nutrition programming over the long term, and many countries are moving in the right direction. Regular data collection is critical to monitor and analyse country, regional and global progress going forward.
34. The Cost of Malnutrition: Why Policy Action is Urgent	This Technical Brief argues that explicit attention to nutrition is warranted as the international community seeks to accelerate and sustain reductions in malnutrition globally. While addressing malnutrition has important moral implications, the Global Panel provides compelling evidence on the economic value of addressing malnutrition. It shows that no nation can afford to waste the economic potential of its citizens on such a scale.
35. Nutrition-sensitive agriculture: What have we learned so far?	A growing number of governments, donor agencies, and development organizations are committed to supporting nutrition-sensitive agriculture (NSA) to achieve their development goals. While consensus exists on pathways through which agriculture may influence nutrition-related outcomes, empirical evidence on agriculture's contribution to nutrition and how it can be enhanced is still weak. This paper reviews recent empirical evidence (since 2014), including findings from impact evaluations of a variety of NSA programs using experimental designs as well as observational studies that document linkages between agriculture, women's empowerment, and nutrition linkages. The paper summarizes existing knowledge regarding impacts, but also pathways, mechanisms, and contextual factors that affect where and how agriculture may improve nutrition outcomes. The paper concludes with reflections on implications for agricultural programs, policies, and investments, and highlights future research priorities.

Title and Link	Overview
36. Stories of Change in nutrition: An overview	After a period of relative success in generating political momentum to address malnutrition, there is an increasing urgency to focus on implementation and impact on the ground. This requires better documentation of the experiences of policymakers, nutrition leaders, program managers and implementers in making decisions on what to do in real time, such as coordinating and implementing multisectoral nutrition plans in dynamic country contexts. The goal of the Stories of Change (SoC) initiative is to foster and support such experiential learning by systematically assessing and analyzing drivers of change in six high-burden contexts (Ethiopia, Zambia, Senegal, Bangladesh, Nepal and Odisha, India) that have had some success in accelerating improvements in nutrition. While recognizing context-specificity, we unpack the key pre-requisites (commitment, coherence, accountability, data, leadership, capacity and finance) that fuel and sustain progress.
37. Tapping the economic and nutritional power of vegetables	Vegetables are increasingly recognized as essential for food and nutrition security. Vegetable production provides a promising economic opportunity for reducing rural poverty and unemployment in developing countries and is a key component of farm diversification strategies. Vegetables are mankind's most affordable source of vitamins and minerals needed for good health. Today, neither the economic nor nutritional power of vegetables is sufficiently realized. To tap the economic power of vegetables, governments will need to increase their investment in farm productivity (including improved varieties, alternatives to chemical pesticides, and the use of protected cultivation), good postharvest management, food safety, and market access. To tap the nutritional power of vegetables, consumers need to know how vegetables contribute to health, and find them at affordable prices or be able to grow them themselves. Vegetable consumption must therefore be nurtured through a combination of supply-side interventions and behavioral change communication emphasizing the importance of eating vegetables for good nutrition and health. To fully tap the economic and nutritional power of vegetables, governments and donors will need to give vegetables much greater priority than they currently receive. Now is the time to prioritize investments in vegetables, providing

Title and Link	Overview
	increased economic opportunities for smallholder farmers and providing healthy diets for all.
38. Drug resistance: Does antibiotic use in animals affect human health?	Antibiotic resistance is a global public health crisis. In this Spotlight feature, we look at the use of antibiotics in animals and its consequences for human health, covering research presented recently at the London Microbiome Meeting.
39. The Other Asian Enigma: Explaining the Rapid Reduction of Undernutrition in Bangladesh	Although South Asia has long been synonymous with persistent and unusually high rates of child undernutrition – the so called Asian Enigma – Bangladesh has managed to sustain a surprisingly rapid reduction in the rate of child undernutrition for at least two decades. We investigate this unheralded success through a regression and decomposition analysis of changes in child growth outcomes across five rounds of DHS surveys from 1997 to 2011. We find that rapid wealth accumulation and large gains in parental education are the two largest drivers of change, though health, sanitation, and demographic factors have played significant secondary roles.
40. Urbanization, Food Systems, and the Diet Transformation in Developing Countries: What Do We Know, and What Do We Need to Know?	This report works to redress the imbalance in the debate and focuses on urbanization, diet diversification, and the (correlated) transformation of the midstream and downstream segments of the food supply chains in Asia. These have been conceptually linked to each other and to upstream transformation in a recent article on the “five interlinked transformations” of the agrifood system occurring rapidly in Asia (Reardon and Timmer, 2014): (1) urbanization together with rapid income growth; (2) diet change; (3) agrifood system transformation (especially in the midstream and downstream segments); (4) rural factor market transformation (in input and credit supply chains into farming); and (5) intensification of farm technology (the agricultural transformation). This report focuses then on the first three of the above transformations
41. The Aggregate Income Losses from Childhood Stunting and the Returns to a Nutrition Intervention Aimed at Reducing Stunting	This paper undertakes two calculations, one for all developing countries, the other for 34 developing countries that together account for 90 percent of the world's stunted children. The first calculation asks how much lower a country's per capita income is today as a result of some of its workers having been stunted in childhood. The analysis

Title and Link	Overview
	uses a development accounting framework, relying on micro-econometric estimates of the effects of childhood stunting on adult wages, through the effects on years of schooling, cognitive skills, and height, parsing out the relative contribution of each set of returns to avoid double counting. The estimates show that, on average, the per capita income penalty from stunting is around 7 percent. The second calculation estimates the economic value and the costs associated with scaling up a package of nutrition interventions using the same methodology and set of assumptions used in the first calculation. The analysis considers a package of 10 nutrition interventions for which data are available on the effects and costs. The estimated rate-of-return from gradually introducing this program over a period of 10 years in the 34 countries is17 percent, and the corresponding benefit-cost ratio is 15:1.
42. The economic costs of stunting and how to reduce them	Investments in very young children – limiting exposure to disease, ensuring adequate nutrients, and stimulating the young child – yield returns across the lifecycle. Stunting – excessively low height-for-age, caused by extreme nutrient inadequacy and repeated bouts of disease – results in impaired brain development, lower cognitive and socioemotional skills, lower levels of educational attainment, and shortness and illness in adulthood. All are associated with lower incomes over the lifecycle. This policy research note draws on a large literature to address two questions and quantitative exercises: • What are the country-specific income per capita losses that countries incur today from having workers who were stunted in childhood? • What are country-specific estimate of the net present value of benefits and costs and the internal rate of return of a gradual rollout out of a package of 10 nutrition specific interventions for 34 high burden countries?