

AGADIR INTERNATIONAL CONFERENCE

"THE INTEGRATION OF SUSTAINABLE AGRICULTURE, RURAL DEVELOPMENT, AND ECOSYSTEMS IN THE CONTEXT OF CLIMATE CHANGE, THE ENERGY CRISIS AND FOOD INSECURITY"

Agadir, November 12-13-14, 2009

BOOK OF EXECUTIVE SUMMARIES

(In alphabetical order)

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CALL FOR PAPERS

Background & Scope

Food security is a human right, and its provision is a common responsibility. Recognition of this fundamental right by the United Nations Universal Declaration of Human Rights (1948) has been marked by a progressive evolution. After 20 years, the Global Agreement on Food Security has reiterated this common responsibility of humankind as well as the need for both moral engagement and cooperation. The World Declaration on Nutrition adopted by the 1992 International Conference on Nutrition laid out clearly problems of hunger, of malnutrition, and of nutrition-related diseases; and it highlighted the import of poverty, ignorance and lack of education as significant drivers of global hunger and malnutrition.

For the first time - on the global level - the issue of food security was addressed by national leaders during the 1996 Food Summit held in Rome. This event placed the issue within a global context by aligning its opportunities with elimination of poverty, attainment of peace, the rational and sustainable use and management of natural resources, conduct of fair trade, and the mitigation and the prevention of natural and man-made disasters. The 2008 Food and Agriculture Organization (FAO) Global Food Crisis Summit resulted in a consensus statement and called on the international community to marshal aid to those countries and regions affected by soaring food prices. Apart from increasing global food production, the statement urged strengthening investments - both public and private sector - in agriculture, in agriculture-related business, and in rural development. Also, it called for re-evaluation of agriculture-related business restrictions, and for increased investments in bio-energy research. From this, donor nations and their international financial institutions have begun to forge a "balance of payments" response; in particular, for countries with limited capacities in food import.

Notwithstanding these high level deliberations to end food insecurity and malnutrition around the world, about 862 million people in countries of the "South" suffer, as yet in 2008. Long-term prospects foreshadow a continuation of this suffering - in fact, a worsening is seen on the horizon, in particular for Sub-Saharan Africa and Southeast Asia. The consequences of the collapse of the latest World Trade Organization talks on the agricultural products trade - in light of the present international tensions relating to climate change - suggest that the food security issue may not resonate with the international community, in the short term.

Currently, the food issue has re-emerged vigorously and has been placed at the highest level of national and international (political, scientific, economic, and advocacy) agendas in a context dominated by such factors as: the soaring prices of basic food products; a decrease in non-renewable energy resources; alarming scenarios of climate change; and widespread domestic and international migration. Concerns now focus on the ability of the planet to feed its 6.5 billion inhabitants, especially in some southern countries where malnutrition and food insecurity are still relevant challenges despite scientific and technological progress and the genetic revolution.

It may seem unnecessary to remember that food insecurity is a result of the combined effects of many factors such as poverty, inadequate food production, degradation of natural resources (that is, the quality of air, land, water, and biodiversity), weather hazards, low incomes of farmers, debt service, the overvalued exchange rate and inflated human population growth. All of these have amplified pressure on the environment and on available natural resources. In addition,

distortion and fluctuations in international agricultural markets—in particular the concentration of agricultural production in some exporting countries recognized by their protectionist trade policies—weigh heavily on food security deficits within many countries. Finally, the liberalization of world agricultural trade is also worsening the already deteriorated situation of the poorest countries.

As a response, it is generally recognized that food production will have to increase to meet the constantly increased global demand. In these circumstances, the pressures that will be placed on agriculture to meet this demand require additional innovative solutions. In this perspective, we do not hesitate to consider sustainable agricultural development as a strategic choice to achieve food security. But the generic and cross-cutting nature of the concept of sustainable agriculture requires precaution in its use, country by country, and continent by continent. In other words, any strategy or policy development could now embrace the goal of sustainability, but the implications of such choices are numerous, particularly with regard to: food sovereignty; air, freshwater, and land use and management; biodiversity; social justice; ethics; and local or global governance. Addressing this specific cross-cutting characteristic of sustainable agriculture, therefore, is very crucial.

Differences between contextual frameworks and objectives often confuse and complicate the decision-making process. Without a clear understanding of the purposes and expected outcomes of sustainable agriculture with reference to sustainable rural development, compromises on strategies and policies to be implemented would be less productive. Although agriculture is an activity integral to human life and that of societies, and given that it marshals and consumes significant resources (that is, financial and technical, natural and human), the choices adopted at different political, socio-economic and scientific levels, there is -as yet- no consensus on the future of agricultural economy, food systems and rural areas. The current global food crisis, however, can be considered at this point as overwhelming evidence.

A focus on agriculture raises other political and scientific debates on land use, technology, redistribution mechanisms, public health, biodiversity, sovereignty and collective security. Exacerbation of the current world food and energy crises and the human and environmental impacts of globalization and climate change (especially on the world's poor) call for a rethinking of development in an holistic manner - and agricultural and rural development in a particular way. Hence the need for an holistic approach - addressing problems with all their recognizable complexity, in a spirit of economic, social and environmental sustainability, equity and solidarity. This calls for a new paradigmatic approach to address the multiple dimensions of the issue area, interrelated with the overarching theme of this international scientific meeting.

Conference Objectives

This Conference, as the outcome of joint efforts, is aimed at independent research organizations, universities, government agencies, policy-makers, public policy advocates, nongovernmental organizations (NGO) and corporate representatives from developing and developed countries. All of these stakeholders are interested in looking critically at the ways in which research is - and can be - used to create change worldwide. This Scientific Meeting will endeavor not only to share research results, but also to identify future research prospects, challenges, issues and concerns. Moreover, the organizers of this Meeting would like to generate innovative thinking in agricultural and rural development and to identify elements of a longer term research agenda to

fill critical gaps in knowledge on these issues - through rigorous, defensible data collection, analysis interpretation and communication. They also would like to develop research projects and networks in these fields involving researchers from both developed and developing countries: believing that partnerships among researchers are critical components of any meaningful effort to develop synergistic research and change agendas.

At the heart of these intellectual concerns there is also the expectation of accomplishing a high visibility scientific event that will share knowledge, skills and successful experiences, while proposing new ways for concrete actions and strategies associated with any policy of sustainable agriculture and rural development. The Conference will provide an opportunity for participants to identify obstacles and constraints across specific regions of the world, and from lessons learned and best practices shared. As the remit of the Conference is global, experiences and issues from any part of the world are welcome.

Conference Themes

I. Conceptual Referential

- Sustainable development: New Approaches
- Concept of Food Security
- Concept of sustainable agriculture
- Food Security, Human rights and justice
- Food security, quality and sovereignty
- Food Security and energy crisis
- Climate change and energy crisis as threats to global security
- Impact of climate change and energy shortage on agricultural development
- Sustainable agriculture and corporate social responsibility (CSR)

II. Agriculture and World Trade

- World trade in food and agricultural products
- Food and agricultural policies in the context of trade liberalization
- Regulatory framework governing international policies and trade in agricultural products
- Food insecurity and global fight against poverty
- Funding of national and international programs for sustainable rural development and food security

III. Rural Development and Sustainable Management of Natural Resources

- Sustainable management of water and air resources
- Preservation of land resources
- Diversification of renewable energy resources
- Dynamism of rural areas
- Biodiversity, agriculture and food security

IV. Sustainable Rural Development, Food Security and Governance

- Sustainable agriculture and global/local governance
- Global governance of food security
- Food security and sustainable agriculture: State of science and technology
- Sustainable rural development and participatory approach
- Public-public and public-private partnership for global food security
- South-South and North-South partnership

V. Promotion of World Food Security

- State of food security and sustainable development across the world
- Key requirements of food security and sustainability
- Sustainable agricultural development as a strategic choice for food security
- Food insecurity and collective security
- Required Infrastructure to develop agricultural production/trade and food security
- Dependence of strategic food products to global market
- Sustainable agriculture and global market mechanisms
- Food security indicators
- Responsible Consumption

VI. Promotion of Sustainable Rural Development

- Land Systems and Sustainable Agriculture
- Research and technology in sustainable agriculture
- Preservation of rural expertise and know-how
- Agricultural productivity and agricultural and rural sustainability
- Human resources for sustainable rural development
- Environmental and Social impact assessment of rural development programs
- Gender dimensions of agricultural and rural employment

VII. Main Areas of Rural Development Policies

- Socio-spatial integration (housing, schools, clinics, centers for agricultural education)
- Integration into agriculture of non-agricultural activities
- Improvement of integration between agricultural, industrial and service sectors
- Promotion of sustainable tourism
- Prevention of forced economic and ecological migration

VIII. Future Research Agenda related to the Conference Themes

- Developing Relevant and Validated Indicators of: Sustainable Development, Rural Development, Agricultural Development, Sustainable Agriculture, Food Security, Corporate Social Responsibility, and Socio-spatial Integration.
- Identifying Best Practices for Synthesizing Findings of Assessments on Climate Change, the Energy Crisis and Food Security for Use in Formulating and Implementing Policies, Decisions and Management Actions on *Sustainable Agriculture and Rural Development*.
- Measuring the performance of management actions through expected and measurable outcomes for *Sustainable Agriculture and Rural Development*.
- Assuring the effectiveness of communicating knowledge from syntheses (that is, integrated assessments) to a variety of attentive audiences (that is, scientific; policy, rulemaking and management; and lay audiences).
- Investigating social science approaches for participatory decision-making (since decisions are made at all geospatial levels [that is, global, regional, national, state and provincial, local, and individual]).
- Suggestions on Other Future Research Agenda Items Are Welcome

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Land resources of Abu Dhabi Emirate, United Arab Emirates (UAE) are being subjected to various land degradation stresses such as erosion, salinization, waterlogging, etc., and hence it is essential to evaluate land degradation status for sustainable use and management of these precious resources. The present study aims at assessment of degraded lands in Abu Dhabi Emirate. The criteria tailored to Abu Dhabi Emirate conditions including hardpan and water table depth, soil salinity (ECe dS/m) at 0-50 & 50-100 cm depths, surface gravels (%) and texture, and uses like landfill and quarrying, was developed. These soil factors create soil condition that is non-conductive for plant growth. Categorizing land degradation in a highly eroding and vulnerable desert environment is very challenging. Thus the evaluation has been completed through a consultative process to obtain a consensus of important factors in this environment. This evaluation deviates from conventional assessments of land degradation that usually consider either the soil's risk (vulnerability) to erosion and degradation under a given set of circumstances (e.g. irrigated agriculture), or the level of degradation that has occurred as a result of human intervention. In this case the evaluation accounts for long-term natural factors that have led to the land being in a relatively degraded state. Thus a saline soil is considered to be degraded even though this may now be considered its natural condition. The ratings are for soils in their natural condition; however they also take present land

use into consideration by considering land under forestry or agriculture as being protected and so not degraded. The criteria are applied using the dominant rating method. The results indicate that areas along the coast and at Sabkhat Matti are considered degraded due to high levels of soil salinity and water table. Many inland sabkha (salt scald), such as those in the south at Liwa area, are also degraded by salt. Deflation plains elsewhere are typically degraded by shallow depth to hardpan or bedrock. The greater part of the Emirate, where sandy soils and dune systems occur and where erosion by wind is current hazard, are evaluated as having a slight degradation risk. The study concludes that $4,424 \times 10^3$ hectares are slightly degraded, 4000 hectares are moderately degraded, and $1,296 \times 10^3$ hectares are highly degraded. This land degradation evaluation leads to delineate areas having high potential for irrigated agriculture in Abu Dhabi Emirate. Such delineation excludes areas which are highly salinized, and waterlogged, gravelly as well as having hardpan within rooting zone. By excluding these degraded areas, it may be possible to practice agriculture on sustainable bases, with the condition that all other management requirements are met.

Keywords: Land Degradation, sustainability, erosion, salinity, Abu Dhabi, UAE.

Biography:

Dr. Abdelfattah is graduated from Cairo University, Egypt on 1991, M.Sc. (Soil) from ITC, the Netherlands in 1998, Ph.D. (Soils), from Cairo University, Egypt in 2002. He worked in Cairo University, Egypt and in the United Arab Emirates University. He holds Associate Professor Position at Fayoum University, Egypt, but he is currently on leave. He is working as Soil Scientist at the Environment Agency - Abu Dhabi.

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THE ENVIRONMENTAL CHALLENGES AND ITS SECURITY IMPLICATIONS FOR SOUTH ASIA

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Armed conflicts are often caused by disputes over shared resources and struggles over these resources are often the result of population depletion, degradation, or unsustainable use. Environmental issues often have a direct impact on armed forces and national security as well. A number of scholars have recently asserted that large-scale human-induced environmental pressures may seriously affect national and international security. It is one of the biggest issues facing the world today—a regional and global threat, no nation can resolve alone. The South Asian region's volatile geological situation and high degree of mutual mistrust and the potential for environmental degradation to trigger events means environmental factors could become a major cause of instability and threat to South Asian security.

Social Effects of Environmental Degradation:

1. Population Growth:

High population growth rates lead to more intense use of resources, exacerbating existing scarcities and over exploitation. The region's population growth will have a direct bearing on its renewable resource system such as forest, land and water as well as on energy demand. The renewable resources are being subjected to significant pressures. Some important factors like deforestation, land degradation

and water crisis indicates a high level of stress on the South Asia region's renewable ecosystem. Conflicts over water will grow over the coming decades as growing populations demand more and climate change affects supply.

2. Agricultural Land and Agricultural Production:

Population increase and unsustainable agricultural practices are primarily contributors to land shortage and land degradation. The impacts of climatic change on potential rice production, as studied by the International Rice Research Institute indicate that increasing temperatures may decrease rice potential yield.

3. Population Displacement or Migration:

Environmental crisis in the rural areas of developing countries has increasingly become an important cause of cross-border migration of population and South Asia is no exception of this phenomenon. Bulging populations and land stress may produce waves of environmental refugees, which spill across borders with destabilizing effects on the recipient's domestic order and on regional stability. Due to migration of refugees, the ethnic and social divide manifested in the state between various groups causing political and civil strife and conflict in society.

4. Disrupted institutions and social relations:

The environmental change and acute conflict result in the disruption of many legitimized political institutions and social relations. The economic deprivation and frustration among people result in overthrowing of established authority.

These social effects, in turn, may cause several specific types of conflict, including scarcity disputes between countries, clashes between ethnic groups, and civil strife and insurgency, each with potentially serious repercussions for the security interests of the South Asia.

It is a matter of great concern that the seriousness of the environmental crisis as a threat to security escapes the attention of the policy makers of the region. The governments of the region should come forward to check the menace before it becomes too late. It

requires a strong political will on the part of governments. The political environment of South Asian nations is not very much encouraging in this regard and the obligatory initiatives are not coming forth. Governments of the region should come forward and should take concrete action to comprehend the emerging threats of the environmental mismanagement.

This paper focuses on environmental crisis as a major factor for the continued challenges to national security in South Asia. It also contains suggestion for the containment of the crisis.

Keywords: Global Warming, Social Effects of Environmental Degradation, Need for a Regional Approach on Environmental Crisis

Biography:

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LA SÉCURITÉ ALIMENTAIRE DES MÉNAGES AU MAROC

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La sécurité alimentaire (SA) est un concept dynamique. À l'origine, cette notion était plus sécuritaire. Actuellement, Il stipule que « la sécurité alimentaire existe lorsque tous les êtres humains ont, à tout moment, un accès physique et économique à une nourriture suffisante, saine et nutritive leur permettant de satisfaire leurs besoins énergétiques et leurs préférences alimentaires pour mener une vie saine et active »

L'insécurité alimentaire résulte plus souvent de conditions de pauvreté que d'offre

insuffisante. Au niveau des ménages la sécurité alimentaire (SADM) se confond avec celle de ses membres. Or la sécurité individuelle intègre en plus de l'état nutritionnel d'autres facteurs sanitaires et environnementaux.

Le Maroc est un pays qui traverse une transition nutritionnelle explicitée par la prévalence simultanée de désordres nutritionnels carenciels et l'émergence des maladies dites de pléthore ou surcharge (Obésité, hypertension...)

Les résultats des enquêtes de consommation et dépenses de ménages ainsi que les enquêtes de niveau de vie sont exploités dans ce travail. Il en résulte qu'un marocain moyen dépense plus de 40% de son revenu pour l'alimentation. Celle ci peut atteindre 54.2% en milieu rural. Ce poste est suivi par l'habitat. Plus la dépense alimentaire est élevée en pourcentage, plus l'effort fourni pour procurer de l'alimentation est grand.

On constate que le budget alimentaire est inférieur à dix MAD par tête par jour chez les trois premiers quintiles. Le budget disponible chez la couche la plus défavorisée est de 3,94 MAD. Il correspond aux dépenses extra-nutritionnelles (café, boissons...) chez la classe la plus aisée. La sécurité alimentaire des ménages intègre plusieurs composantes agricoles, socioéconomiques, politiques et nutritionnelles et sanitaires. Elle doit être inscrite dans un programme national de nutrition.

Mots clés: Sécurité, Alimentaire, Dépense, Consommation, Maroc.

L'ÉLEVAGE CAMELIN EN ALGÉRIE : QUEL SCÉNARIO POUR QUEL AVENIR ?

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L'élevage camelin algérien, concentré dans trois grandes aires de distribution, arrive à fournir toute une gamme de produits et de services grâce aux facultés d'adaptation qu'a développé le dromadaire dans un milieu où la vie est extrêmement difficile. Malheureusement, ces dernières décennies ont connu une érosion de la filière cameline

caractérisée par une régression des effectifs. Les contraintes n'étant pas les mêmes, nous étions amenés à analyser la diversité des systèmes existants et leur durabilité compte tenu des changements (écologique, économique et social). L'approche systémique menée auprès de 249 chameliers nous a permis de relever l'existence de systèmes très diversifiés avec une dynamique différente. Aussi nous sommes demandés à la fin quel avenir se dessine pour ces systèmes et ce à travers deux scénarios censés caricaturer des situations proches de la réalité et de conclure que le semi nomadisme, ce système où on y trouve peu de trace de fléchissement, mérite d'être conforté en essayant de trouver des formes d'intégration qui permettront la pratique d'élevage camelin dans une optique de développement durable.

Mots clés : Élevage Camelin – Systèmes de production – Sahara Algérien – Devenir

Biographie :

Abdelkader Adamou est enseignant universitaire depuis 1980 relevant du Département des Sciences Agronomiques à l'Université de Ouargla, modules enseignés : biologie animale, zootechnie générale, zootechnie spéciale. Plusieurs responsabilités : chef de département de zootechnie, Directeur des études, secrétaire général de l'université, conseiller auprès du Recteur. Responsabilité actuelle : Chef de Cabinet à l'Université. Membre de l'équipe de recherche cameline relevant du laboratoire de Protection des Écosystèmes dans les Zones Arides et Semi-arides, domaine de recherche : camélogie (systèmes de production et endocrinologie). Encadrement de plusieurs mémoires d'ingénieur en agronomie (une quarantaine); présentation de plusieurs communications lors de manifestations scientifiques nationales et internationales.

ESTIMATING THE LIBYAN IMPORT DEMAND FUNCTION OF VEGETABLE OILS DURING THE PERIOD (1980-2007)

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The main objective of this study is to conduct an empirical investigation vegetable oils import demand in Libya which includes (olive oil, sunflower oil, corn oil, sesame oil, palm oil and coconut oil). The most significant factors affecting the demand of imports include: own import price, Gross Domestic Product (GDP), domestic vegetable oils and Libyan population.

Ordinary Least Squares (OLS) was employed to estimate equation parameters using annual data covering the period from 1980 through 2007.

The results of multiple regression analysis in log-linear model indicate that the imported price and Libyan population are the most important variables responsible for setting the quantity of imports of vegetable oils to Libya, and that these factors together explain about 56% of the changes in the quantity of imports. The results also show that the demand of vegetable oils imported is price inelastic (-0.364).

FORME JURIDIQUE ET FONDEMENTS IDÉOLOGIQUES DE L'ENTREPRISE COOPÉRATIVE : ATOUTS D'UN ACTEUR CLÉ DU DÉVELOPPEMENT AGRICOLE DURABLE

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Personne ne peut nier aujourd'hui que la question agricole occupe une place incontournable et stratégique dans la politique global d'un pays. A cet égard, dans un contexte de libéralisation et de mondialisation des économies, d'universalisation des marchés provoquant une concurrence acharnée et une demande plus exigée en terme de qualité, de nombreux pays ont développé des innovations organisationnelles très importantes visant en premier lieu à améliorer leurs performances productives agricoles mais également à repenser une nouvelle articulation entre l'économique, le social et l'environnemental de leurs systèmes productifs.

Et c'est à ce niveau que sont interpellées les coopératives, qui bien que communément peu distinguées des entreprises classiques, sont pourtant, par un statut juridique les attachant à leur circonscription, des entreprises non délocalisables, et ont un lien fort avec leurs environnement géographique et social dans la mesure où leur développement est étroitement lié à la situation de leur territoire d'activité. Par ailleurs, les principes régissant la répartition de leurs résultats et leur mode de gouvernance, en font à priori des entreprises aux ressources collectives durables et qui répondent à des principes de démocratie, d'équité, de solidarité; d'implication de territoire, de promotion des hommes et de mutualisme permettant une progression collective.

Certes, les coopératives agricoles apparaissent, du fait de leur statut juridique, comme des structures qui disposent d'atouts majeurs pour garantir aux générations actuelles et futures la transmission et la valorisation d'un patrimoine économique, environnemental et social. Toutefois, pour remplir leur mission; il y a nécessité d'associer à ces structures des démarches approfondissant les principes coopératifs et la prise en compte des préoccupations environnementales, pour les pousser à s'impliquer amplement dans le processus du développement durable.

La réflexion que nous proposons à travers cette présentation, nous amena à se pencher dans un premier temps, sur l'analyse des paradoxes du développement agricole durable (I). Avant d'être conduit, dans un second point, à juger la place de la coopérative, dans l'échiquier des structures organisationnelles, et à tester sa capacité, comme outil d'implication territoriale d'une agriculture économiquement forte et socialement responsable, (II).

Mots clés: Agriculture, coopérative, développement rural durable.

UNE INNOVATION TECHNIQUE DANS L'AMÉNAGEMENT DE L'ESPACE RURAL EN CÔTE D'IVOIRE : LA RIZIPISCICULTURE DANS

LA SOUS-PRÉFECTURE DE MÉAGUI (RÉGION DU BAS-SASSANDRA)

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Cette étude analyse les mutations agro-économiques en cours en milieu rural forestier ivoirien en général et à Méagui en particulier. Les difficultés que rencontrent les cultures pérennes (entre autres le café et le cacao) ont déclenché dans cette localité un regain d'intérêt pour l'agriculture vivrière et notamment pour la rizipisciculture. L'intérêt croissant dévolu à cette culture s'explique par le fait que les revenus tirés du café et du cacao fluctuent fortement depuis plusieurs années, mais aussi par le fait que la localité enregistre des déficits au plan de la production alimentaire et notamment au plan de la production du riz et du poisson. Or ces denrées occupent une place essentielle dans l'alimentation des populations locales. Le riz est un aliment de base dans la région et le poisson y pourvoit près de 72% des protéines d'origine animale consommées. La rizipisciculture constitue donc à Méagui une nouvelle option pour la production d'aliment de base et pour la diversification et la recomposition de l'agriculture et de l'économie rurale en crise.

Mots clés: Rizipisciculture, innovation technique, recomposition, aménagement rural, Méagui.

COMPARAISON ENTRE LE RENDEMENT EN CARCASSE CHEZ DEUX POPULATIONS CAMELINES ALGÉRIENNES: LE TARGUI ET LE SAHRAOUI

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Les chameliers du Sahara algérien restent intimement liés à l'activité cameline grâce à la gamme très variée qu'elle procure en produits (viande, lait, poli...) et services (transport) à moindre coût dans un milieu où la vie est extrêmement difficile et ce grâce aux particularités d'adaptation du dromadaire tant

sur le plan anatomo-physiologique que sur le plan comportemental. Certes certains produits et services ont tendance à disparaître, mais la viande reste un grand pourvoyeur en protéines animales non seulement pour les autochtones mais également pour les habitants originaires du nord surtout parmi ceux qui souffrent de problème de cholestérol et ce au vu de la structure de la viande de dromadaire (viande maigre) et son prix accessible aux faibles revenus par rapport aux autres viandes rouges.

Dans ce contexte, nous avons essayé, à travers la présente étude, de déterminer le rendement en carcasse chez deux populations camelines algériennes : le targui et le sahraoui en vue de déterminer l'âge idéal d'abattage. L'étude a porté sur cinq classes d'âge regroupant chacune 10 mâles de chaque population.

Le résultat nous a permis de constater une nette différence en matière de rendement dépassant parfois les 20% chez le sahraoui et que le rendement est en corrélation positive avec l'âge jusqu'à 7 ans chez le sahraoui et 10 ans chez le targui à partir desquels le rendement commence à baisser. Nous pouvons donc conclure que l'âge idéal d'abattage se situe dans la catégorie 7-9 ans chez le targui et dans la catégorie 5-6 ans chez le sahraoui.

Mots clés: Viande Cameline – Rendement Carcasse – Population Targui – Population Sahraoui – Sahara Algérien

Biographie :

Baïssa BABELHADJ est Dr. vétérinaire. Diplômé en 1988 de l'Université de Constantine, lieu de travail : zones sahariennes. Domaine privilégié : élevage camelin. Fonction actuelle : Inspecteur au niveau des abattoirs de Ouargla et enseignant vacataire au département des sciences agronomiques de l'Université de Ouargla (module enseigné : pathologie cameline). Membre de l'équipe de recherche cameline du laboratoire protection des écosystèmes dans les zones arides et semi-arides.

LES EFFETS DES SUBVENTIONS AGRICOLES AUX EXPORTATIONS ET DES TECHNOLOGIES DE L'AGRICULTURE DE PRÉCISION SUR LES PAYS DE L'AFRIQUE SUBSAHARIENNE. UNE

ANALYSE COMPARATIVE EN TERMES DE COMMERCE INTERNATIONAL STRATÉGIQUE

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L'agriculture mondiale est actuellement influencée par une série de nouvelles technologies regroupées sous le terme générique d'Agriculture de précision (Ap). A partir d'une étude du secteur cotonnier, cet article explore les effets qui pourraient résulter de l'adoption de l'Ap en matière de commerce international. Il s'agit de comprendre dans quelles mesures l'Ap peut contribuer à déstabiliser plus encore les termes de l'échange entre pays de l'AOC et pays du Nord. On montre que ces technologies peuvent être utilisées, par les pays du Nord au détriment de ceux de l'AOC pour la mise en œuvre de politiques commerciales stratégiques reposant soit sur des subventions, soit sur l'élaboration de normes environnementales. De telles politiques sont d'autant plus crédibles qu'elles sont difficilement condamnables par les instances internationales.

Mots clés : Agriculture de précision, commerce international, coton, subventions, politiques commerciales stratégiques, normes, environnement.

DÉVELOPPEMENT DURABLE ET LUTTE CONTRE LA PAUVRETÉ. CAS DU PROJET DE GESTION DES RESSOURCES NATURELLES AU GOUVERNORAT DE MÉDENINE (TUNISIE)

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La question du développement durable pose le problème de la conciliation entre la croissance économique, les objectifs sociaux et la préservation des ressources naturelles, en effet, il se pose la question de savoir si l'intégration du concept de la coopération internationale permet au développement durable d'atteindre ses objectifs et

principalement la réduction de la pauvreté. Pour mieux cerner l'incidence de développement durable sur la lutte contre la pauvreté, il faut être bien montrer que l'amélioration de condition de vie d'une telle population ne peut pas réalisé sans une gestion durable des ressources naturelles, sans une concrète égalité entre les sexes, sans un développement participatif et sans une bonne gouvernance. Dans ce contexte, se montre le projet de gestion des ressources naturelle au gouvernorat de Médenine au sud Tunisien, ce projet essaye de faire fructifier toute une approche philosophique et technique de la politique internationale en matière de développement durable et de coopération internationale, tout en visant la réduction de la pauvreté dans quelques zones rurales du gouvernorat. Ce projet a permis des réalisations importantes en matière d'aménagement et de réhabilitation de périmètres irrigués, des travaux de conservation des eaux et du sol, d'infrastructure de base, de développement agricole avec la mise en œuvre d'une approche participative dans la zone d'intervention ce qui a permis d'améliorer les condition de vie dans la région.

Mots-clés : Développement durable, Projet de gestion des ressources naturelles, Lutte contre la pauvreté, Coopération internationale, Gouvernorat de Médenine, Développement participatif.

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GLOBAL GOVERNANCE FOR FOOD SECURITY AND THE RIGHT TO FOOD: CHALLENGES AND UNRESOLVED ISSUES

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The dramatic scope of the world food crisis has recently become fully recognized as a growing number of countries are suffering from chronic hunger and its disastrous consequences in political, economic, social, and health terms. Moreover, the provision of food is globally undergoing radical transformations and, as a consequence, conventional governmental and intergovernmental regulations can no longer adequately respond to existing and emerging food risks. Meantime, failure to deal efficiently with the environmental declines that are undermining the world food economy - most important, falling water tables, eroding soils and rising temperatures - forces to presume that a global collapse is possible.

As well, as demand for food rises faster than supplies are growing, the resulting food-price inflation puts severe stress on many countries already teetering on the edge of chaos. As a result, almost no country is completely immune to the impacts of food shortage. If the food situation continues to deteriorate, entire nations and their social orders will break down at an ever increasing rate because, in geopolitical terms, more food crisis will undoubtedly engender more collective insecurity (many regions in Africa and Asia are currently experimenting such scenarios). In the 20th century, the main threat to international security was superpower conflict; today it is failing and disintegrating states which become an increasing source of terrorism, drugs, weapons and refugees, threatening political stability everywhere. Thus, it is not the concentration of power but its absence that puts the current world at risk.

At the root of the failure to effectively reduce hunger, is the failure of the global food security governance and architecture. Weak institutions and lack of effective coordination and participation at global, regional and national level impede the implementation of sound food security plans. At the global level, a truly representative, action-oriented body with strong political support, credible scientific basis and adequate financial support is lacking. At

national levels, good governance and Right to food principles are not promoted and embraced as key goals in many countries.

Based on these assumptions, It is now abundantly clear that conventional regulation approaches to food security have failed. Thus, it is becoming increasingly crucial to develop and implement adequate global food governance arrangements with the active involvement of major stakeholders (inter-governmental organizations, nation-states, private sector, civil society organizations, etc.) and the support of sound scientific evidence.

In addition to concerns over food and commodity price variations, attention should also focus on global redistribution mechanisms and long-term threats, such as demographic growth and urbanization, growing demand for biofuels, land, water and environmental constraints, and climate change.

This paper reviews the challenges and unresolved issues facing global governance for food security and the innovative regulatory arrangements that are being introduced by different stakeholders by reference to the right to food principle and collective security imperative.

Keywords: Global Governance, Human Rights, Right to Food, Food Crisis, Global Threats, Collective Security.

CUTTING EMISSIONS AND DOUBLING FOOD PRODUCTION. INCOMPATIBLE TARGETS?

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The world has recently woken up to the prospect of the Malthusian nightmare of population rising faster than food production, after decades of assuming that surplus production was the problem to be addressed. That this arises as we try to address climate change and the eventual inevitability of declining fossil fuel supplies is not a random coincidence. However, the level of panic in some parts of the media is unwarranted, although useful in raising awareness that food security cannot be taken for granted. Those

who see food security in purely national or European terms are mistaken; the potential output of the UK and Europe should be seen in terms of a contribution to global food security rather than self-sufficiency. The potential to increase world food production is considerable, but both the necessity and possibility of doubling it by 2050 must be questioned. The necessity assumes continued population growth, continued increases in meat consumption and a failure to reduce waste. The possibility assumes a combination of a step change in yields and a huge increase in the area of agricultural land. Both of these routes have implications on the emission of greenhouse gases and climate change.

Bringing abandoned farmland back into use will deliver much of the required increase in production with relatively small negative environmental side effects. This is already happening in Brazil as a result of the 2008 price spike, but we should not assume that this would fill the gap. If, however, large tracts of virgin land are required, the loss of major carbon sinks will have a profound effect on emissions. The purported 100m ha of abandoned land in Brazil is partly back in production and there is anecdotal evidence that some was never agricultural land in the first place, but the Cairns Group of agricultural exporters could probably increase production significantly without using virgin land.

Far more land has been abandoned in the poorest countries of the world, largely as a result of export subsidies and dumping, with the USA and EU major culprits. I drafted a motion to Liberal International Congress last year that proposed, amongst other things, that aid budgets be re-focussed on agricultural production. President Wade of Senegal took much of the motion forward to the FAO Food Summit in Rome and since then the G8 has agreed that agriculture should become an aid priority. Agreement has been reached at the WTO to end export subsidies by 2014, so overall there is some reason for optimism. However, much of this abandoned land is of low productivity and will require significant investment to reinstate. Agreements are all well and good, but action on the ground is vital. Volatile output prices will also hold back

the process, as farmers on much of this land will not be certain enough of making a profit.

Increasing yields on existing land also presents a risk of increased emissions from agriculture. Fertiliser nitrogen is effectively almost pure energy and contributes around 50% of agriculture's carbon footprint, but it more than doubles the yield of many staple crops. We are currently seeing yields of wheat in Russia and the Ukraine increase rapidly as modern methods are adopted and more fertiliser is applied. However, increasing the use of nitrogen not only raises CO₂ emissions from agriculture but also those of nitrous oxide, a greenhouse gas far more potent than CO₂. If we are going to increase yields without compromising greenhouse gas targets, it is clear that we need to do much more in technological terms than simply increasing inputs. This means embracing technological advances in agriculture as well as viewing the efficient use of resources to produce high yields as a desirable outcome.

There is evidence that the price spike of 2008 has changed public attitudes. There is a renewed concern about abandonment of agricultural land, a recognition that research should focus on producing high yields with low greenhouse gas emissions, a growing public realisation that biotechnology will play a key role in crop improvement and research into ruminant diets is already cutting methane emissions. The EU and USA will continue to reform their agricultural policies such that the productive capacity of land is maintained without causing abandonment elsewhere. However, we still need a more rational approach to the use of pesticides (which in most cases reduce the carbon footprint per tonne of output) and more research on exploring the potential of nitrogen fixation to reduce dependence on fertiliser. We also need to pay much more attention to phosphate use and the utilisation of crop by-products as a source of energy and raw materials. Some advocate restricting meat eating, but I would reject anything as illiberal. Information on the carbon footprint of the food we eat should be encouraged and alongside price signals, will deliver a gradual change in habits.

The world can avoid a food supply crisis in the coming decades and still meet challenging targets for greenhouse gas emissions, but only if the global population begins to level out, governments adopt sensible agricultural policies that avoid both protectionism and land abandonment and the public take a more positive view of technological advance in agriculture. This is a tall order and the least line of resistance in the short to medium term will probably be the loss of more rainforest and other virgin lands. Only a robust and binding deal at Copenhagen can mitigate this. When reality bites and we have more deficit world harvests like the one of 2007 public attitudes will change, but they may turn against measures to combat climate change. Politicians will need to show more courageous leadership if we are to avert this scenario.

Biography :

Dr Phil Bennion is currently chairing a DEFRA LINK research project on minimising nitrous oxide emissions from agriculture, as well as being Chair of LDEG.

- He is working farmer striving to become carbon neutral but at the same time as maintaining high output. I grow food crops, bio-energy crops and am applying for permission also for wind turbines on my land.
- He sit on the main committee in the UK that commissions research on sustainable crop production on behalf of UK farmers.
- He is the Chair of a new 4 year research project on minimising nitrous oxide emissions from arable farming.
- He has a political interest and deeply involved in policy formulation in this area for both the Liberal Democrats of the UK and the ELDR grouping of parties in the European Parliament.

USE OF SURFACE MODIFIED INORGANIC NANO MATERIALS AS SLOW RELEASE NITROGEN FERTILIZER

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Effect of surface modification of hydrothermally synthesized zeolites (SZC and SZM) on sorption of NO₃⁻ has been studied. The use of surface modified zeolites as slow release fertilizer of nitrogen is also studied. Sorption isotherms of NO₃⁻ on surface modified zeolites were measured at aqueous concentration of 160-280mgmL⁻¹. The synthesized zeolites were modified with large quaternary alkyl ammonium groups i.e. hexadecyltrimethyl ammonium(HDTMA) and Dioctadecyldimethyl ammonium(ADOD).

The surface modified forms showed much higher sorption (HDTMA K_d =1038.6-1146.6 and ADOD K_d = 1146.6-1019.0) then the unmodified materials (K_d = 77.6-62.8). The surface modification increases the capacity of zeolites to retain anions. The modified materials were thoroughly characterized using Instrumental techniques viz. X-ray diffraction, FTIR, SEM, EDS, TEM and DTA/TGA. Treating the material with fertilizer (NH₄NO₃) does the nitrate loading. The slow release studies have been performed by soil column percolating system and thin layers in funnel analytical test. The results of above study indicates that surface modified zeolites is a good sorbent for NO₃⁻ and a slow release of nitrogen is achievable as it releases NO₃⁻ still after 15-20th day of leaching study. These experiments suggest that surface modified zeolites have a great potential to remove anionic pollutants from water and also as the fertilizer carrier for slow release of nitrogen.

Keywords: Surface Modified Zeolites, Adsorption, Waste Water Treatment.

Biography:

Dr. Deepesh Bhardwaj is an Associate Professor, Department of Engg. Chemistry, Institute of Information Technology and Management, Gwalior. He has Published 2 international papers (Indian journal of Chemistry and Journal of Radio-analytical and nuclear Chemistry.) and 5 papers in different conferences (2 international and 3 national). He has also given the 2nd prize for paper

presentation at national conference at Jiwaji University, Gwalior, India.

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KNOWLEDGE SHARING FOR CLIMATE CHANGE ADAPTATION IN AFRICA: OPPORTUNITIES AND CHALLENGES

Binetou Diagne & Blane Harvey
AfricaAdapt KSOs*

Knowledge sharing is the exchange of ideas and experiences through networks of relationships. It differs from information sharing, which is typically concerned with channeling messages between knowledge producers and target audiences.

Historically, the creation and dissemination of “valid” knowledge was the monopoly of certain persons or institutions. This resulted in the marginalization of segments of society based on gender, race, language and other discriminating factors. However, the emergence of new participatory tools such as web-based “social media” including Twitter, wikis and blogs, participatory video and mobile phones, has led many to argue that a new “architecture of participation” is emerging and will democratize access to and production of knowledge (Thompson 2008). These developments present both exciting opportunities and important challenges to complex concerns such as climate change, development and global environmental governance.

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ÉTUDE D'IMPACT DE LA QUALITÉ SUR LE DÉVELOPPEMENT DES PRODUITS ALIMENTAIRES AU MAROC : DE L'ASSURANCE QUALITÉ AU MANAGEMENT DE LA SÉCURITÉ SANITAIRE DES ALIMENTS.

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Deux volets distincts mais interdépendants des systèmes d'assurance qualité intéressent l'entreprise de production/transformation de produits alimentaires. Le premier envisage la qualité en termes de conformité à certaines exigences du marché, par exemple la supériorité d'attributs ou de caractéristiques désirables comme la taille, la couleur ou des propriétés organoleptiques. Le second considère la qualité comme synonyme de sécurité sanitaire, et les aliments doivent donc être garantis contre des niveaux inacceptables de risques microbiologiques, chimiques ou physiques. Dans de nombreux pays, les pouvoirs publics concentrent leurs ressources sur l'aspect sécurité sanitaire dans le but de protéger le consommateur, de faciliter le commerce de ces produits et de préserver la réputation nationale de fournisseur d'aliments sains. Cela suppose que le producteur dispose de moyens de contrôle adéquats de la qualité de ses produits.

Les clients institutionnels et consommateurs individuels du monde entier exigent de plus en plus des produits et des services de qualité, répondant de façon précise à leurs besoins, avec des délais de plus en plus courts et aux plus bas prix possibles. Cependant, ce n'est pas tout: ils désirent aussi que leurs fournisseurs fassent preuve de leur capacité à répondre à ces exigences désormais basées sur des normes communes et internationales. La sécurité sanitaire des aliments est devenue un objet de préoccupations majeures des intervenants professionnels et des consommateurs des produits des Industries Alimentaires et Agroalimentaires (IAA). En effet, face aux différentes crises et risques associés qui se succèdent dans ces filières, ESB (Encéphalopathie spongiforme bovine), dioxine, OGM (Organismes Génétiquement Modifiés). Le consommateur ne sait plus en qui avoir confiance (Cerafel, 2001). Nous sommes donc entrés dans une ère où le consommateur a légitimement besoin d'être informé et

sécurisé. Les professionnels des entreprises alimentaires sont également confrontés au défi de la qualité face aux exigences des standards internationaux et régionaux. Dans le même sens, les perspectives d'amélioration continue du système qualité des entreprises halieutiques s'annoncent nettement favorables et évolutives après la mise en vigueur de nouveaux référentiels de la qualité spécifiques aux filières des industries alimentaires et agro-alimentaires (IAA). C'est le cas, en l'occurrence, de la norme ISO 22000 et des procédures de la traçabilité mises en application depuis 2005.

Par conséquent, produire ou fabriquer un produit de qualité ne suffit plus. Il faut être capable d'assurer la régularité de cette qualité et de rendre totalement transparent le processus de fabrication. Face à cette situation, la filière doit communiquer au mieux avec les consommateurs en leur fournissant toutes les informations qu'ils attendent. La traçabilité est devenue ainsi le maître mot dans toutes les décisions en la matière qu'elles soient gouvernementales, sectorielles ou industrielles. (Jacquement, 2002).

En s'appuyant sur les résultats issus du dépouillement des données significatives du sondage réalisé en 2004 et actualisé en 2007, nous tentons, dans un premier temps d'appréhender le comportement qualité des entreprises alimentaires face à la multiplication continue et aux interférences accrues des référentiels normatifs de la qualité des entreprises opérant dans des entreprises alimentaires au Maroc. Nous nous efforcerons, par la suite, d'en déduire les tendances majeures de la restructuration par niveau du système de gestion de la qualité des industries halieutiques au Maroc, censé évoluer progressivement du contrôle à l'assurance qualité avant de tendre vers la management de la qualité totale.

Mot clés : Qualité; Sécurité; Agroalimentaire; Maroc; Consommateur

Biographie:

BOURMA Khalid est titulaire d'un Diplôme d'Études Supérieures Approfondies (DESA) en Sciences de Gestion et inscrit en Thèse de Doctorat en Génie industriel: Gestion du

changement par la qualité dans les industries agro-alimentaires.

EFFECT OF SALINITY ON GROWTH AND IONIC COMPOSITION IN CHENOPODIUM QUINOA

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Chenopodium quinoa was tested for its response to high salinity concentrations in the culture medium. Five week old seedlings were irrigated with fresh water as control and 4 seawater (SW) dilutions (20%, 30%, 40% and 50%). Maximum biomass was registered in 20% SW treatment and the threshold salinity tolerance has been noted in 30% SW treatment. Root to shoot ratio increased with the increase of salinity in the culture medium, while the relative growth rates (RGR) decreased significantly. Ionic analysis of vegetative organs and seeds revealed that Na⁺ and K⁺ concentrations increased in all organs tested, while Ca²⁺ concentration decreased significantly. Mg²⁺ concentration uptake was not affected by the presence of salt in the culture medium.

Keywords: Chenopodium Quinoa, Biomass Production, Salt Stress, Sea Water, Ionic Composition

IMITATING NATURE TO ENRICH WASTE WITH NEW VALUES AND USE IT AS A NEW RESOURCE

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Water, earth and air, from which most of the indispensable resources for human survival derive, until recently seemed to have no value and were exploited in the belief of unlimited availability. On the one hand we are witnessing the continuous rise in the price of raw materials and a strong demand for recyclable materials, while on the other hand we are

producing more waste. Hence we should not expect the Earth to produce more but we should do more with what the Earth produces, and adopt a sustainable waste management. Therefore we must turn to Nature, where there is no waste and even surpluses are metabolized by the system itself. If we adopt this principle in production, it will favor the development of a zero-emissions production, because the waste (output) of one process is used as a resource (input) for another production process. This leads us to a change in perspective that goes in the direction of thinking by connections; in specific the research, in collaboration with Neosidea Group, is about the proposal of an instrument for analysis based on the concept of an open system that would allow the configuration and realization of networks of connections among different companies: it leads industries to organize themselves into local sustainable networks, open productive systems, where waste products of one can be sold as a resource to another and benefit both of them. The processing system was also supplemented with the function of geo-locating business is and materials and this provides a solution and that gives not only information regarding new areas of application of the outputs but also determines with precision and localizes by territory the flows of material within a local network whose nodes are represented by the companies present on that territory: by doing this valorize and encourage local economies and provide an accurate evaluation of market opportunities in areas not yet using and benefiting from the systemic approach. This technology makes it possible to obtain different levels of information regarding new business opportunities related to the companies on the network. New flows of material and energy generate internal connections. Waste enriched with new values becomes a resource and made available for producing new products strictly connected to the local know-how. By applying the systemic approach we can see how the cultural identity of the territory is reinforced, the biodiversity is conserved and the quality of the products generated is improved: this creates positive

effects on the territory in both environmental and economic terms.

Keywords: Output-input, system, connections, resource, software

Biography:

Clara Ceppa earned Ph.D. degree in Design Culture at Politecnico di Torino in Italy. In these years Clara Ceppa focused her attention on the current and increasing problem of waste, that derives from different productive processes and areas of consumption. Therefore she developed several research on the one hand about materials and energy that are involved in some different productive cycles and on the other hand about packaging fields, in particular food-pack.

ORGANIC FARMING, LINKAGES WITH FOOD SECURITY AND BONDED LABOR

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This study establishes a significant link between Organic farming, bonded labor and food security in Pakistan.

Land ownership is crucial for the rural poverty reduction in Pakistan. Land ownership pattern shows highest land concentration in Sind and Balochistan among all provinces of Pakistan, other two Provinces NWFP and Punjab has relatively low land ownership. Due to low asset bases, rural poor is forced to live in vicious circle of poverty.

Pakistan ranked as food insecure country in general but persistent water shortage and land degradation may threaten food security in future. Out of 121 districts of Pakistan 95 are reported to be food insecure by the World Food Program standards. The Provincial break down of the food insecure areas show that Western Province of Balochistan and Sindh are the worst affected Provinces. Out of 25 districts of Balochistan 20 districts were indicated as highly food insecure, while six out of 17 districts in Sindh were described as highly food insecure, same way the North West

Frontier Province (NWFP) had six districts ranked as food insecure out of 20 districts.

Share cropping is major tenancy arrangement in Sindh. Due to exploitive conditions in contract, share cropping system does not benefit farmers. As a result farmers do not save a good deal of their income thus most of the time for their consumption they have to borrow from land lord against their future they enter an other contract which makes literally them prone to more exploitation.

Inorganic farming method is more capital intensive, a share cropper farmers has to give up their major portion of profit for inorganic inputs. The data tables show that switching over from inorganic farming to organic farming pattern can change farmer's living standards.

The cost benefit analysis of organic –inorganic crop reveals that in terms of yield it is possible that good farming practices may yield if not more than inorganic farming may give at least equal yield. However, on expenditure side framers can save a lot of income portion, which is to be spent other wise on inorganic inputs. Through organic method their savings may increase which simply means that farmers can get rid of weak negotiated borrowings from landlord thus less probability to fall as bonded labor.

Organic cropping pattern will increase food security situation as soil becomes more fertile and productive in long run. Consuming organic products simply means more healthy life. With better marketing management organic foods can earn more profits for farmers which will increase their purchasing power.

The study proves that more expenditure occurs on inorganic crops as compared to inorganic, cost-benefit ratio is higher in organic crops compared to the inorganic crops.

Keywords: Organic farming, Food security, Bonded Labour, Pakistan.

AFRICAN AGRICULTURE AT CROSSROADS: BALANCING THE NEEDS OF INCREASED PRODUCTIVITY AND THE CHALLENGES OF SUSTAINABILITY. THE CASE OF FADAMA AGRICULTURE IN SEMI-ARID NORTHERN NIGERIA

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Africa is threatened by the current global food crisis more than any other region in the world. This has once again raised the question of food security on the continent and increased the call for a change of approach in which smallholders and indigenous knowledge systems will play a pivotal role. The main challenge facing the continent is how to balance the quest for food self-sufficiency and the demands of sustainability. This research assesses the productivity and sustainability of fadama (floodplains) farming systems of semi-arid Northern. Findings reveal a delicate interaction and negotiation across the formal and informal boundaries where traditional agricultural practices, based on an understanding of the particular physical reality and exploitation of natural synergies, are combined with inputs typical of conventional agriculture. African agriculture thus stands poised at crossroads; whether to abandon tradition in favour of entirely 'modern' methods and export markets as often advocated for in certain circles or depend on time tested indigenous knowledge systems and grassroots-defined development vision which combines popular livelihoods with respect for nature's systems. Drawing on Bruno Latour, the metaphor of 'hybridisation' is used to justify a negotiated compromise between official discourses, which promote the use of chemicals, and grassroots reality which relies on nature's systems.

NEW CURRICULUM REFORM FOR SUSTAINABLE AGRICULTURAL KNOWLEDGE FOR DEVELOPMENT: THE CASE OF IBN ZOHR UNIVERSITY, MOROCCO

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The bio-geographic diversity of natural resources in the South of Morocco, combined

with a culture of regional know-how, offers a variety of regional products: the Argan tree, prickly pear, honey, olives, dates, capers, almonds, carob shrubs, saffron, medical and aromatic plants, roses, sardines, mussels,...

From economic point of view, the regions in the South of Morocco and their products constitute an important source of revenues or essential nutrition for the local population and by itself a pillar of a traditional agricultural system, which needs to be modernized, protected and valued for how to better safeguard the economic development of these regions.

To achieve this objective Ibn Zohr University developed an education, learning and research program with strong practical emphasis, a practical bachelor on: "Valorization of natural resources and local know-how in the South of Morocco". This training is achieved in partnership with local organizations and agriculture institutions. It aims to endow young people with knowledge, know-how, and spirit of initiative and necessary skills allowing them to develop projects based on local potentialities (products and know-how) within their regions of origin since they are coming mainly from rural areas.

This would allow, to consolidate a local development carried by the rural populations which would find in just return fruits of their work and, to contribute in an effective way to the stabilization of the populations in these zones while improving their incomes.

The periods of innovative projects and trainings in professional environment can enrich young people experience. Their formation in the ecological and economic stakes would facilitate sustainable management of natural resources and valuation of human capacities.

CENTER OF AGRO-ECOLOGIC PRODUCTION AND EDUCATION, SANTO DOMINGO DE RONDOS: A SUSTAINABLE PROJECT FOR REGIONAL DEVELOPMENT, EDUCATION AND PRODUCTION

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Aim: The project consists in the creation of a technical college with a incorporated trial farm and food processing teaching and research on agrarian production, alimentary industries and forestry.?

Education, social aspects: The college will provide food and housing for the students and the courses are free of charge. The agrarian production and subsequent processing and commercialization will cover the expenses of the college. The students will have theoretical courses three days a week and do practical work for the institution other three days.

Research, archaeology: For the agriculture a modernized version of the agrarian techniques of a fallen endemic pre-inca civilization called Yaru will be used based on techniques known in the Yaru period. The artefacts of this period found close to the institution might be useful for the reconstruction and the revival of the traditional and adjusted land use forms which can be combined with modern techniques. Attendant archaeological studies in collaboration with agronomists were done and will be continued.

Animal keeping:

- 100 dairy cows,
- rabbits, laying hens, guinea pigs (*Cavia porcellus*), earthworms (*Lumbricus ssp.*)
- The animal manure is used for the culture of earthworms and production of biogas

Organic farming techniques:

- terraces and ramps
- mixed cultivation
- water transport via underground pressure tubes
- hibernation of seeds in high altitudes (disinfection and to facilitate germination)
- drip irrigation

Forestry: Establishment of a tree nursery with different species: fruit trees, precious wood as nogal (*Juglans regia* L.), la guinda (*Prunus ssp.*), el aliso. (*Alnus ssp.*)

Processing and Marketing: Concerning the processing of raw products as milk, potatoes maize we will produce: cheese, butter, curd cheese and yogurt, starch, dried potatoes, tocush (fermented potatoes or maize), chuño (freeze dried potatoes), potato flour.

All products will be produced firstly to cover regional needs, than national demands and in the future for exportation.

Keywords: Sustainable development education, civilization Yaru, organic farming, archaeology

ÉNERGIE DES CO-PRODUITS DE L'AGRICULTURE PAR LA VOIE BIOGAZ – EXEMPLES DE L'AGRICULTURE ORGANIQUE ALLEMANDE COMPARÉ A LA PRODUCTION DE MAÏS A FINS ÉNERGÉTIQUES

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On constate une demande croissante des aliments organiques d'une cote et d'énergie renouvelable de l'autre. Le potentiel de production de biométhane issue des résidus invendables (lisier, restes de fourrage de culture dérobée paille) des systèmes d'exploitation organiques était étudié ainsi que les effets sur récoltes, qualité des produits, circulation des éléments nutritifs, éluviation d'azote et émissions des gazes a effet de serre.

Approche: Un projet multidisciplinaire (Université de Giessen chaires d'Agriculture Organique et Microbiologie; Institute de l'Énergie et Environnement Leipzig) financé par “Deutsche Bundesstiftung Umwelt, Osnabrueck”, a déterminé la potentielle production d'énergie de deux systèmes d'exploitation organiques. Les récoltes et le taux de matières volatiles sèches étaient

mesurés, le rendement de méthane estimé par données littérature:

- 1) système d'exploitation sans bétail
- 2) système d'exploitation incluant bétail

On les a comparé avec:

- 3) la production de maïs sur 25 % de la surface agricole utile (littérature)

Résultats:

L'incertitude des résultats est relativement large causé par variations des récoltes et des données de rendement de méthane dans la littérature. Pour le système d'exploitation sans bétail une récolte moyenne de 1730 m³ CH₄ * ha⁻¹ a été déterminé. Ici mélanges graminées légumineuses donnent 40 % de l'énergie suivi de la paille avec 36 %. Les cultures dérobées (18 %) et résiduels de patates et céréales (7 %) contribuent peu.

Le système d'exploitation incluant bétail rendait 1730 m³CH₄ * ha⁻¹. La répartition résultait en 29 % pour lisier 23 % pour cultures dérobées et 49 % pour paille. La récolte énergétique des deux systèmes était comparable à maïs (non organique) plantée 25 % de la surface agricole utile (littérature).

Conclusions: Les potentielles gains d'énergie considérables ainsi que les avantages pour récoltes, qualité des produits et l'environnement indiquent que la production de biogaz est une option à envisager sérieusement. Les résultats justifient les efforts pour résoudre les problèmes liés à cette technologie.

COMMUNITY PARTICIPATION IN WATER RESOURCE MANAGEMENT: AN INTEGRATED APPROACH FOR WATER-BORNE DISEASE PREVENTION AND SUSTAINABLE DEVELOPMENT

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Population growth in the developing world is becoming a daunting challenge: it is occurring at a rapid and sustained pace, and registering significant increases in both rural and urban areas. The phenomenon is having a

considerable negative impact in several areas, in particular on water quality. While demand has increased, the world's poor still lack access to basic water-related services, and are directly affected by water shortage, inadequate sanitation and the spread of serious diseases linked to poor water quality.

Community participation in water management and, in particular with water-related diseases prevention, has been demonstrated to be the key to successful and sustainable development. It also has strong social impacts, as not only the quality of life for the people involved is significantly improved, but active participation also promotes effective leadership and local ownership.

This contribution provides an analysis of community participation in water resource management and, in particular, in the prevention and control of vector-borne diseases linked to aquatic ecosystems. Successful experience in the field by an Australian NGO in prevention of Dengue fever will be showcased to demonstrate how engaging communities, through a genuine bottom-up approach, can make a substantial difference in the implementation of health projects, and contribute to remarkable and sustainable development outcomes.

Keywords: Community Participation, Dengue, Safe Water, Sustainable Development, Viet Nam

Biography:

Debora Di Dio works for AFAP, the Australian Foundation for the Peoples of Asia and the Pacific, an Australian NGO for international development. She has recently completed her Master of Art in Development Studies and Culture Change at Macquarie University in Sydney, Australia. Her major research interests focus on the links between gender and development, gender analysis into natural resource management, and the effectiveness of community participation in development programmes.

ÉVALUATION DU RISQUE SANITAIRE EN L'ABSENCE DU CONTRÔLE DE LA QUALITÉ ET

L'HYGIÈNE DES ALIMENTS DANS LA VILLE DE SIDI BEL ABBÉS, ALGÉRIE

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La sécurité sanitaire des aliments passe par l'évaluation quantitative des risques par les experts scientifiques, et sa gestion par les politiques. Seulement dans les pays en voie de développement, L'ignorance du problème, est à l'origine de la non maîtrise de sa gestion, est l'impossibilité de mettre au point des stratégies de contrôle de l'hygiène alimentaire, ce qui se traduit de toute évidence par des factures importantes en santé.

En effet l'absence de structures efficaces pour l'hygiène, l'inconscience des populations sur les risques encourus, le constat du non respect des textes en vigueur et l'absence de sanctions aux manquements en matière de protection de la santé sont perceptibles concrètement.

On se contente de contrôles à posteriori sans respect des normes alimentaires internationales sur la salubrité et l'innocuité des aliments visant à la protection du consommateur.

Dans ce sens en procédant à l'analyse et à l'évaluation du risque chimique et bactériologique à travers la chaîne alimentaire dans une des villes de l'ouest algérien, on a pu mettre en évidence les risques pour la santé des consommateurs.

Mots clés : Risque, Qualité, Hygiène, Chaîne alimentaire, Santé.

POLICIES FOR SUSTAINABLE AGRICULTURAL PRODUCTION AND CONSUMPTION

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The world is both obese and hungry. People die from the effects of both over-consumption and malnutrition. Much agricultural production produces excessive amounts of greenhouse

gases, uses unsustainable amounts of resources such as water and pollutes the environment. The resulting food often contributes to diet-related ill-health and disease.

We need to develop policies that promote an agriculture which produces health-giving foods in a way that minimises resource use and environmental impact and ensures the welfare of farm animals. This must include trade in healthy foods at affordable prices.

Policies need to be developed in co-operation between relevant national and international bodies and with the active involvement of intergovernmental organisations, such as WHO and FAO.

Policies could include public health awareness programmes, ending subsidies for intensive agriculture, promotion of low-impact farming, government sponsorship of healthy food programmes and selective taxes on unhealthy foods.

Keywords: Sustainable Food System; Water Use; Climate Change; Livestock Production; Animal Welfare

Biography :

Joyce D'Silva is Ambassador and former Chief Executive of Compassion in World Farming, the leading charity advancing farm animal welfare worldwide through research, education and advocacy. Joyce is a compelling communicator on the impacts of industrial livestock production on animal welfare, the climate and the environment. She has been published widely on the welfare of farm animals and sustainable farming.

CULTIVATING FAITH: THE RELATIONSHIP BETWEEN ISLAM AND SUSTAINABLE AGRICULTURE IN RURAL COMMUNITIES OF AMERICAN MUSLIMS

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Scholars and activists have recognized the role of religion in advancing sustainable practices, including farming (Oelschlaeger 1994, Peterson 2005, Taylor 2007, Nathan 2007). However,

there is little research on how religion helps or hinders agriculture, especially among Muslim communities. By studying rural Muslim communities in Mississippi, Illinois, and Pennsylvania, my paper investigates the influence of Muslims' beliefs, practices, and institutions on the decision to farm, the practice of farming, community formation, and available socio/economic networks of support. These communities were motivated by concerns of food security and sovereignty; however these farms were established as religiously motivated projects. I draw on data gathered through focus groups, interviews, surveys, and participant observation and situate it using primary sources, accounts of other Muslim farm communities in America, and theoretical and methodological insights from research on religious farm communities (Gomez, 2005, Dannin 2002, Curtis, 2006, Peterson 2005, Taylor 2007). My paper provides information and methodologies that can be used to develop programs and policies or tools to investigate other religious groups

Keywords: Food Sovereignty, Islam, Religion, Rural Communities, Small-Scale Agriculture

Biography:

Eleanor Finnegan is a doctoral candidate in the Religion Department at the University of Florida. Her dissertation is on farming among American Muslim communities. She has presented research on American Muslims at international and national conferences, such as the Annual International Conference of the International Society for the Study of Religion, Nature, and Culture and the American Academy of Religion Annual Meeting. The recipient of several Foreign Language and Area Studies (FLAS) fellowships, Ms. Finnegan is a contributor to *Islamic Perspectives*, *Environmental Ethics*, and the *Encyclopedia of Environment and Society*.

EFFECT OF UREA TREATED SORGHUM STOVER SUPPLEMENTED WITH LOCAL PROTEIN SOURCES ON THE PERFORMANCE OF SHEEP

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Feeding trials were carried out on farm to examine the effect of supplementing urea treated sorghum stover (UTSS) with sesame cake (SC) or fishmeal (FM) on the body weight of sheep. Twenty one male sheep were divided into three groups of seven sheep in each treatment. All the sheep used in this experiment were from the same breed (Gerej), with the same age and initial body weight from the same area.

The experiment was conducted in Gash Barka, western lowlands of Eritrea. All the animals were fed on UTSS for an adaptation period of 15 days. The control diet consisted of UTSS fed ad libitum. The second and third treatments consisted of UTSS fed ad libitum supplemented daily with 80 g/head of SC and 60 g/head of FM, respectively. The experimental period lasted for 90 days. Feed intakes and body weights were recorded regularly. The dry matter intake (DMI) in sheep was significantly different ($P < 0.05$) between the control and SC supplemented groups, but not between the other treatments. It was highest for the SC supplemented group at 847 g/head/day followed by the FM supplemented group and the control at 826 and 821 g/head/day, respectively. Sheep supplemented with SC had the highest significant ($P < 0.05$) body weight gain (BWG) (134 g/head/day) followed by the group supplemented with FM (115 g/head/day). The BWG for the control was 66 g/head/day. Feed conversion was best on SC (6.92) followed by FM (7.70) supplementation. The lowest cost of feed per kg of BWG (16.91 Nfa) was attained by supplementing with SC. It can be concluded that feeding UTSS alone or supplementing with small amounts of sesame cake or fishmeal can increase the liveweight of sheep at a reasonable cost.

Keywords: Fishmeal, Liveweight, Sesame Cake, Sorghum Stover, Urea Treatment.

THE SURVIVOR RISK BEHAVIOR OF PEASANTS

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The theories of Absolute and constant Relative Risk Aversion (ARA and cRRA) don't account for risk-averse peasants that behave risk neutral or risk lovers, neither for the variables correlating with their actual risk behavior. Both the well-known stylized behavior of peasants and their risk behavior are better explained by their survival concerns. This paper questions the rationale supporting the view of risk-averse-ruled peasants and develops an extension of ARA and cRRA for describing the survivor risk behavior. Empirical evidence –744 samples of the VLS of ICRISAT– supports the extended theory of relative risk behavior.

Keywords: Peasants, Risk, Survival

Biography:

Flavio Pinto is a researcher and Lecturer at the Institute for International Management, University of Flensburg, Germany. Researcher at the Division of Resource Economics, University of Humboldt, Berlin, Germany. Education: PhD Economics (Nov. 2009), MSc. Sustainable Energy Systems, MSc. Computer Science, B. Physics. Current Positions: Fellow University of Flensburg (Germany) Institute for International Management. Visiting Researcher Humboldt University Division of Resource Economics. Faculty of Agriculture and Horticulture. Experience: Fellow Leibniz Institute for Agricultural Engineering Postdam-Bornim (Germany): Research on Institutions and Biofuels. Lecturer Pontificia Universidad Javeriana (Colombia) Faculty of Environmental and Rural Studies. University Professor 1995-2001 Universidad Autónoma de Bucaramanga (Colombia) Faculty of Energy Engineering.

DEVELOPMENT OF NEW TECHNOLOGICAL APPROACH TO MITIGATE SALINIZATION

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An experimental design was laid out during two successive summer seasons of 2007 & 2008 at three different sites of soil salinity levels (3.13, 6.25, 9.38 dS/m) at the experimental farm of Faculty of Agriculture, Fayum University, Egypt. The experiment was conducted to examine how can inoculation with *Rhizobium* sp, and/or *Azospirillum* sp combined with different concentrations of ascorbic acid combinations mitigate the negative effects of salinity on soybean growth and yield.

Soil salinity significantly resulted in reduction in plant height, number of leaves per plant, leaves area per plant (cm), shoot dry weight, total chlorophyll and total carotenoids. Soil salinity significantly reduced ascorbic acid, total indoles, α- amylase activity and polyphenoloxidase activity while increased total soluble phenols, total soluble sugars and free proline. Soil salinity significantly decreased the percentage of N, P, K, Fe, Mn, Zn and Cu while increased Na and Cl. Soil salinity as well significantly decreased all seed yield parameters in addition to seed yield quality (protein and oil contents). There were no significant differences between both cultivars used in most measured traits. Treatment T6 and T7 (biofertilizer associated with ascorbic acid at 100 and 200 ppm, respectively) recorded the best results compared with the other treatments (control, biofertilizer alone, ascorbic acid at 100 ppm and ascorbic acid at 200 ppm).

Key words: Soil salinity, Biofertilization, *Rhizobium*, *Azospirillum*, Antioxidant, Enzymes, Total soluble Sugars, Free Proline, Mineral Nutrients and Total Chlorophyll and Carotenoids.

Biography:

Maybelle Saad Gaballah is a Professor in NRC, Cairo, Egypt. Water Relations and Field Irrigation Dept. Agricultural Science Division.

Obtained Ph. D in 1991 in the Field of Plant Ecology.

Appointed as a Professor in 2005 worked in joint projects between NRC and U.K. (Imperial College). Also with Gansu Institute in China.

Attended many conferences in Germany, Botswana, China, Austria, London.....

Editor in SJI journals, Nobelonline journals,INSINET, IJAR, supervised many theses in the field of plant water relations.

CHANGES IN AGRICULTURAL LANDSCAPE AND FOOD PRODUCTION PATTERN: SOME ECOLOGICAL IMPLICATIONS AND POLICY OPTIONS IN THE AGRARIAN ECONOMY OF INDIAN PUNJAB

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During the post green revolution period (mid sixties), owing to major technological breakthrough along with the availability of adequate marketing infrastructure and price support policy led to a rapid shift in the agriculture landscape and food production patterns. More or less, an increasing trend in the values of Herfindahl index and continuous decline in the value of Entropy index from 1960-61 to 2007-08 has confirmed that Punjab agriculture has become predominantly a monoculture of rice – wheat rotation. The technology encompassing intensive cultivation, high use of agro-chemicals, and greater requirement of water and rapid growth of mechanization has resulted in manifestation of several adverse effects on environment and ecological balance. Presently, the major concern is the decline of ground water as 85 per cent of area of the state is facing the problem of falling water table. The fertility of Punjab soils has diminished over the years with deficiency of all the micro and macronutrients. Resource conserving technologies and organic matter management practices that enhance resource/input use efficiency for better utilization of natural resources and hence the sustainability are now being considered more seriously than ever before. Excessive tillage is energy, time and cost consuming and is

considered harmful to the soil health. During the past few years, scientists have suggested that physical properties favorable for plant growth are destroyed by too much tillage. The cost of hydrocarbon fuels is rising day by day and is a well-known fact that they are bound to be exhausted sooner or later. Keeping these factors in view, researchers world over have studied tillage operations more closely. A great deal of emphasis is being laid on the modernization of agriculture, with a view to raise the production per unit area, the income of the farmers under sustainable environment. Zero/minimum till technology is a resource conservative technology and farmers in Punjab are picking up this technology slowly. To make the adoption of this technology faster, there is a need to identify the constraints inhibiting such technologies and solutions thereof. To accomplish such goals, it is essential to develop multidisciplinary approach in production agriculture by involving the fields of sociology, anthropology, environmental sciences, and economics etc for the development of a sustainable agriculture and food system.

Keywords: Agrarian Ecological Problems, Agricultural Sustainability, Conservation Agriculture

Biography:

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INDIA'S GLOBAL SEAFOOD TRADE, SUSTAINABILITY ISSUES AND SOCIAL CONCERNS

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The seafood exports rank number one in all agricultural exports from India. Over the period 1980 through 2006, India expanded its seafood exports nearly 8.5 times. India's share in the world trade increased from 1.61% to 1.95%. However, the share in global export values through seafood exports decreased from 2.24% to 2.05%. The consistently declining sea catch is

a matter of great concern raising several issues in management of fisheries resources and their sustainability. For the industry it means stress on supplies of raw materials.

India's export performance has been affected by several factors which include emergence of new competitors like Vietnam with more efficient supply chains and significant transfer of quantities in the Indian exports from high valued shrimp to low valued ribbon fish. In the key markets, there is also a clear shift away from high valued black tiger shrimp (*P. monodone*) which has been India's prime export to low valued product (*P. vannamei*). The Indian exports are mostly dominated by shrimp and frozen fish. The share of shrimp in the export value is declining. The demand from key markets such as Japan, USA, and EU has been declining. The Indian sea food industry has to look for new markets such as Poland, South Africa, and The Russian Federation. The industry has to also give a quantum jump to the value added exports.

On the supply side, the focus in future has to be on rejuvenating sea resources and diversifying aquaculture. The large dependence on the black tiger shrimp is quite risky. The industry should develop strategies to mitigate the risk involved in production and trade. More importantly the industry has to move towards product certification and eco-labeling for fisheries sustainability. The eco-labeling should be a complement to traditional fisheries management programmes.

Keyword: Seafood, Shrimp, Export markets, Aquaculture, Competition, Risk

QUANTITATIVE ASSESSMENT OF CLIMATE CHANGE WITH USING WEATHER GENERATION MODELS AND DOWNSCALING GCM DATA AT 2020S IN TEHRAN, IRAN

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Human activities are changed the composition of the earth's atmosphere. Increasing levels of

greenhouse gases like carbon dioxide in the atmosphere since preindustrial era are well-documented and understood. This negative effects cause considerable change in weather condition at several parts of the earth. Scientists believe that most regions will continue to warm, although some areas will be likely warmer than others. It is difficult to predict which region will become wetter or drier, but scientists generally anticipate increasing precipitation and evaporation, and drier soil in the middle parts of the century. Assessing the climate change in future need to introduce climate scenarios, like "Ocean – Atmosphere 3D Linked Global Circulation Model". In this article a stochastic weather generator: LARS-WG was employed to generate daily climate change scenarios. The simulated results were fed into Arc/View to produce regional impact maps for visual assessment and spatial analysis under A1 scenario from ECHO-G model.

Simulated results show that in 2010-2039 (1) yearly mean rain decrease almost 0.5 mm and yearly mean temperature increase around 0.1 centigrade degrees. (2) Number of hot days decrease almost 2 days per year and number of glacial days decrease around 8 days in mean. (3) Dry days increase into 5 days and wet days decrease into 8 days. Heavy rain will increase about 8%. In the contrary with previous data(1982-2005), it is predicted that adverse torrent will increase.(4) generally in 2020s we have warmer and drier weather, with torrent rains which can destroy land cover and soils.

Keywords: A1 scenario — Arc/View – ECHO-G - climate change –LARS-WG model

Biography:

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A NEW CONCEPTUAL FRAMEWORK FOR ASSESSING RURAL DEVELOPMENT PERFORMANCE: SUSTAINABILITY OF SCALE, SCOPE, AND INTEGRATION

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Many sustainability indicators have been used for assessing rural development. They evaluate relative performance of alternative rural development projects and programs from economic, environmental, and social perspectives. However, they do not illustrate why a project outperforms others and thus a conceptual framework for explaining the results is needed. Here, we present a new framework for assessing rural development performance on the basis of sustainability of scale, scope, and integration.

The framework we developed can be expressed as a 3 x 3 matrix. Row headings include “economy”, “ecology”, and “sociology”, which explain three pillars of sustainability. Column headings contain “scale”, “scope”, and “integration”, which illustrate three types of strategies. Each cell explains the concepts such as “economy of scale”, which is a classical concept for describing reduction in cost per unit as the increase of production, “ecology of scope”, which will be useful in illustrating the fact that environmental impacts of diversified production can be small, and “sociology of integration”, which can be used as a concept for justifying rural activities such as local-production and local-consumption.

After presenting an outline of the new conceptual framework, tripartition of strategies and tripartition of criteria are illustrated. Then, theoretical and practical implications of the framework are discussed using the concepts such as eco-industrial parks.

Keywords: Sustainability Indicators, Scale, Scope, Integration, System Design

Biography:

Dr. Kiyotada Hayashi is Leader of the Environmental Assessment and Management Research Team at National Agricultural Research Center, National Agriculture and Food Research Organization in Tsukuba, Japan. He has been a Guest Research Scholar at IIASA and an OECD fellow at ETH Zurich. Recently, he organized an OECD conference on biological resource management for sustainable agricultural systems.

LE SECTEUR AGRICOLE FACE AUX DÉFIS ÉNERGÉTIQUES : CAS DES PAYS MAGRÉBINS

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Le marché agricole présente des caractéristiques propres qui le rendent très sensible et sujet à des enjeux majeurs pour les nations. La vague actuelle consistante à la libéralisation des échanges met au défi l'équilibre fragile de ce secteur. Les pays en développement, mis sous pression par plusieurs organismes internationaux, semblent opérer un arbitrage entre libéralisation contrôlé et protectionnisme déguisé. Cet article tente de décrire le profil international du marché agricole et alimentaire et justifier la nécessité d'un protectionnisme prononcé dans le cas des pays en développement. Les économies décrites font partie du Maghreb arabe, une région dont les échanges sont restés principalement de nature agricole. Pour détourner les pressions externes une différenciation du produit agricole offre une solution alternative plausible.

THE ROLE OF BIOFUELS IN THE SUSTAINABILITY OF THE ENVIRONMENT

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The protection of the environment and the preservation of nature's gifts has become a determining part of our social-economic life nowadays. The basic reason for this is, on the

one part the ever quicker utilization of natural resources, and on the other part the increasing amount of polluting materials emitted into the environment. As a result of all these, the quality of the soils has deteriorated, as has the purity of the waters above and sub-terrain; the natural habitats have decreased and have been damaged as well.

In the wake of the environmental aspect's moving to the forefront today biofuels are playing an increased role, they may turn out to play an important role in the fight against global warming. The biofuels are plant or animal derived resources, and we differentiate between two main types: bioethanol and biodiesel.

In this study we wish to deal with utilization and the future of the plant derived biofuels in the EU. The governing principle of the EU pertaining to biofuel specifies a 5.75%, and its agreement dated March 2007 specifies a 10% component of biofuel component for 2020 within total fuel consumption. According to calculations in order to achieve a 10% organic component in engine fuel by 2020, the basic ingredients will have to be cultivated on 38% of cultivation soil area. The remaining area would be shared between plant cultivation for alimentation and fodder purposes. It is obvious that if biofuel, food and fodder will battle over cultivation area the smallness of the area could cause produce prices to rise, which in turn causes a significant rise in food prices.

The study tries to find an answer to the question as to what extent the EU's biofuel production and utilization, and as to how it can contribute to the sustainable development of our environment, as well as what the long term economic and social effects the production of biofuels may be.

Keywords: Cereals, Energy, Competitiveness, Environment, Food

Biography:

Dr. Peter Karácsony (PhD): an Assistant Professor, Institute of Corporate Business and Management Sciences, Hungary.

Anzelm Kiss: Student of University of West-Hungary, Faculty in Agricultural and Food Sciences, Hungary.

Dr. József Orbán (PhD): Associate Professor, Head of the Institute Management and Social Sciences, Hungary.

TRANSCULTURAL GARDENS. A PROPOSAL FOR THE EXPLOITATION OF URBAN VOIDS AS INTENSIVELY PRODUCTIVE LAND AND AS A METHOD OF URBANIZATION OF MINORITIES. CASE STUDIES THAT DEMONSTRATE THE DESIGN TOOLS AND THE MANAGING METHODOLOGY

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The paper examines the introduction of urban agriculture as a medium for gradual urbanization, collaboration, exchange and identification of new multicultural urban inhabitants, especially immigrants originated from rural areas. The paper after defining what is urban agriculture for today's urbanism, examines the terms multiculturalism, transculturality, and multifunctionality in continuously productive urban voids and periurban areas. It also describes intercultural gardens in Germany, proposes the concept of transcultural gardens and presents six not yet realized projects in Greece.

Keywords: Urban Voids, Urban Agriculture, Transculturality, Immigrants, Vertical Gardens

Biography:

Elina Karanastasi, Architect National Technical University of Athens, MArch Berlage Institute. Has worked on various urban and architecture projects in the Netherlands and Greece. Has won European 7 competition in Neapolis Larisa proposing sustainable housing on intensified productive ground, has been lecturing on urban voids as productive green areas and has been designing products and construction components for vertical horticulture. www.exsarchitects.com / www.wallpot.com. She is teaching architectural and urban design in Technical University of Crete, Department of Architecture.

RISK COMMUNICATION AT THE HUNGARIAN GUAR-GUM SCANDAL

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Millions of people are not able to access to healthy and safe food due to food insecurity that may occur at the household, regional, or national level. National policies, insufficient agricultural development and low levels of education may lead to the causes of food insecurity. Furthermore food quality and food safety is a major benchmark of economic development. Food-borne risks to human health can arise from biological, chemical or physical hazards. Risk analysis is a key discipline for reducing food-borne diseases, food insecurity and strengthening food safety systems. Food safety risk analysis used for assessing and managing risks associated with food hazards. The risk analysis process contains three separate elements: risk assessment, risk management and risk communication. This paper focuses on risk communication. The study intends to present the case of reaction of the Hungarian consumers to a crisis that can affect wide range of the society. In 2007 the „guar gum scandal” caused panic among the consumers: dioxin-contaminated guar gum entered the food chain. This food contamination scare followed previous occasions such as production of intoxicated paprika powder, re-labelling of overdue meat packages and BSE crisis in Hungary. To analyze risk perception and consumer behaviour we conducted a primary research with a sample size of 1577. As a result it can be declared, that the Hungarian population reacted sensitively to the guar gum crisis. Despite the intensive media-communication many misconception remained unclear for the consumer. Many of them were not able to recognise relevant information, while some others seemed to react different way that authorities expected. The paper summarizes the experiences of the case study for official food safety communicators.

Keywords: Food Quality, Risk Perception, Risk Communication, Guar Gum, Consumer Behaviour

Biography:

KASZA, Gyula is head of division at the Ministry of Agriculture and Rural Development, State Secretariat of Food Chain Control, Division of Public Relations, Hungary. He is a PhD candidate at Corvinus University of Budapest, Faculty of Food Science. His professional interest is risk communication of food safety.

SZIGETI, Judit Erika is a Ph.D. candidate at the Corvinus University of Budapest, Department of Food Economics. Her thesis is “Analyzing welfare effects in the Hungarian food-consumption by method of econometrics”.

PODRUZSIK, Szilárd is a lecturer at the Corvinus University of Budapest, Department of Food Sciences. His research area is the food sector. Within the sector his focus is on the food consumers welfare, food logistics and its process optimization.

KESZTHELYI, Krisztián is a student at the Corvinus University of Budapest. His studies at the Faculty of Food Sciences, and his special field is the management related activities in the food industry.

CONTRIBUTION OF VEGETABLE FARMING TO HOUSEHOLD FOOD SECURITY AND RURAL LIVELIHOODS IN UZUMBA MARAMBA PFUNGWE COMMUNAL LANDS OF ZIMBABWE

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Food grain crops are the focal point of household food production in communal areas of Zimbabwe. Prioritization of cereals has been done at the expense of horticultural products’ potential to stabilize communal food systems. The paper examines the contribution of commercialized small scale vegetable farming to household food security and rural livelihoods in Chikwira and Manyika wards of Uzumba Maramba Pfungwe district in Zimbabwe. Information was collected through

questionnaires, informal interviews and on-site observations as the basis for rapid rural appraisal. Vegetables grown include tomatoes, cucumbers, leafy vegetables, beans, okra, carrots and onions. Vegetable productivity for different species varies from as high as 4500 kilogrammes (kg) per acre per year for tomatoes to as low as 93 kg for carrots. Farmers were motivated into farming by factors such as retrenchment in early 1990s due to Economic Structural Adjustment Programme (ESAP), limited off-farm jobs as a result of national economic meltdown since the turn of the twenty-first century, existing favourable environmental conditions and increased demand of vegetable produce in urban area due to meat shortage. Each household has an average plot size of approximately 0.5 hectares in the dryland fields and 0.1 hectares in wetlands. Land was acquired through traditional leadership, fragmentation of existing plots and inheritance. Strategies used to boost crop productivity involve use of pressure-gradient induced hosepipes and conservation farming practices such as strategic timing in watering of crops, organic manure and composting. High vegetable producers use inorganic fertilizers as large piece of land were put under cultivation. Ninety-four percent of households now afford at least three decent meals per day. Each person's daily income is now US\$ 3,29 and US\$ 17,98 at parallel and official market rates. Problems like shortage of and high costs for transport, poor roads, inappropriate use of chemicals and inadequate irrigation infrastructure are inhibiting vegetable farmers from realizing their maximum potential. These can be mitigated through formation of social organizations for co-ordinated planning of farming activities. Farmers need to be trained on proper storage, use and application of chemicals which maybe toxic to both ecological and social environments. The paper concluded that vegetable farming resulted in improved rural food security and livelihoods. Therefore, sustainable reduction of hunger in rural societies of developing countries could be achieved if development is centered on local initiatives.

Keywords: Vegetables, Farming, Dietary diversity, Income, Livelihoods

Biography :

Dr. Thomas Marambanyika is a lecturer in the Department of Geography and Environmental Studies at Midlands State University, Zimbabwe. He graduated from University of Zimbabwe with B.A Honours in Geography and Masters of Environmental Policy and Planning. He teaches undergraduate courses; Food Security and the Environment and Natural Resources and Sustainable Development. Research interest areas include; food security, rural livelihoods and natural resources management.

PERCEPTION OF THE PROBLEMS IN FARMING COMMUNITY IN DISTRICT HYDERABAD

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The study on Perception of the Problems in Farming Community in District Hyderabad was conducted through a set of questioners in Hyderabad District during 2007. Three hundred respondents (growers) were personally interviewed, their responses were tabulated. Data were collected on the basic information about cotton growers such as their ages, education, tenancy statuses, sizes of farm, farming experiences, and living status was asked which would highly influence the use of communication media for the perception of the Problems in Farming Community. The growers of the area stated that irregular supply of irrigation and lack of visit of extension personnel, non-availability of inputs, high cost of inputs, were common problems of the area. It was also found that these are causes for low yield. It is recommended that government should ensure the better facilities for continue supply of irrigation water and pure inputs with minimum rates in the market.

Keywords: Perception, Problems, Respondents, Cotton and Hyderabad

Biography:

Dr. Jan Muhammad Mari, working as Assistant Professor Department of Entomology, Sindh Agriculture University, Tando Jam, Pakistan. He has got B.Sc, M.Sc and Ph.D Degrees in Department of Plant Protection, Sindh Agriculture University, Tando Jam. He has experience in teaching, in subjects: Integrated pest management, economic entomology, basic ecology and biological control, IPM informatics to the Graduate, Post graduate and PhD classes. He has worked as a Principal Investigator on “Documentation of Insect Pest and their Natural Enemies on Cotton Crop” and on “Evaluation of different hosts for the rearing of *Chrysperla carnea* (Stephan)”. He has got Seven TRAININGS on different teaching and research methods. He has participated as speaker on six international conferences in Malaysia, China, Egypt, South Africa and Yemen. He is First Author of Fifteen publication in International and national journals. He has supervised Ten students in Thesis work in M. Sc in Entomology and Plant Protection departments.

FOOD SECURITY KEY ISSUES FOR AN EMERGING MENA PRIORITY

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In recent years, universal access to affordable food has emerged as a critical issue around the globe. The heightened concern regarding secure, ready access to food supply stems from a confluence of events: soaring commodity prices driven by severe global supply disruptions, a reduction in global stock levels, the increasing cost of agricultural inputs, and competition from alternative energy producers for crops such as corn. The Middle East and North Africa (MENA) region, in particular, is strongly affected by this trend, given limited arable land and irrigation water. In some MENA countries, food shortages have led to civil unrest. Escalating food prices have also forced some MENA governments to step up food subsidies, further straining public finances that are currently under pressure from the global economic crisis.

Biography :

Booz & Company is a leading global management consulting firm, helping the world's top businesses, governments, and organizations. Its founder, Edwin Booz, defined the profession when he established the first management consulting firm in 1914. Today, with more than 3,300 people in 59 offices around the world, the Company brings foresight and knowledge, deep functional expertise, and a practical approach to building capabilities and delivering real impact. They work closely with their clients to create and deliver essential advantage. Homepage: www.booz.com.

تحديات الفجوة الغذائية في الوطن العربي وسبل مواجهتها

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تفرض التغيرات الاقتصادية العالمية المصاحبة للعولمة العديد من التحديات التي تمس قضايا أمنية وسياسية واقتصادية لدول العالم ولدول المنطقة العربية، ومن بين هذه التحديات التي تواجه البلدان العربية قضية الأمن الغذائي، إذ يعد قصور الإنتاج عن مواكبة الاستهلاك في مجال الغذاء للمنطقة السبب الرئيس للفجوة التي نشأت نتيجة للطلب المتزايد الناتج عن الزيادة السكانية التي يشهدها العالم العربي في ضوء تناقص الموارد .

وترتكز المشكلة الأساسية على التحليل الدقيق لمفهوم الأمن الغذائي العربي في ظل الظروف الاقتصادية والسياسية الراهنة، حيث أصبح جليا اليوم وأكثر من أي وقت مخاطر الاعتماد على الخارج في تأمين حاجة السكان من الغذاء في عصر تميز بالتقلبات الاقتصادية والسياسية العالمية، إذ أصبح من ضروريات الأمن القومي وأهم مقومات القرار السياسي لأي مجتمع أن يحقق حد أدنى على الأقل من الاكتفاء الذاتي من السلع الغذائية الأساسية، وهنا يلزم توضيح حدود كل من الأمن الغذائي، الاكتفاء الذاتي.

و مع تسجيل أسعار القمح ارتفاعات قياسية في الأسواق العالمية لاسيما في ظل التوقعات القائلة بوصول مخزون القمح خلال العام الحالي لأدنى مستوياته منذ نحو 60 عاما، تواجه الدول العربية ارتفاعا في فاتورة واردات القمح حيث يتم استيراد 49% من حاجات الدول العربية من تلك السلعة الإستراتيجية، فعلى الدول العربية أن تتخذ التدابير اللازمة للتخفيف من حدة هذه المشكلة، ولا يتم ذلك إلا بالاهتمام بالقطاع الفلاحي أولا ثم تحقيق التكامل الاقتصادي العربي ثانيا، وذلك حتى لا تبقى بطون الشعوب العربية معلقة بأيدي الدول الأجنبية؛ فما السبيل إلى تحقيق الأمن الغذائي العربي؟

من خلال هذه الورقة البحثية نتطرق إلى الفجوة الغذائية التي يعاني من العالم العربي، وتحديات القطاع الفلاحي، وأيضا سبل مواجهة هذه الأزمة.

الكلمات المفتاحية: الفجوة الغذائية - الأمن الغذائي العربي - واقع الأمن الغذائي العربي - صادرات وواردات القطاع الفلاحي - تحديات القطاع الفلاحي.

LE MÉTABOLISME DU DÉVELOPPEMENT RURAL DURABLE. UN APERÇU HOLISTIQUE

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Il serait judicieux, aux fins de disséquer le métabolisme rural dans toute sa complexité, de prendre appui sur une contextualisation paradigmatique, au regard de l'approche du développement durable, en mettant l'accent sur l'ampleur de la crise systémique, à la fois alimentaire, énergétique et climatique, qui ébranle la Planète (I).

Il apparaîtra alors, d'une part, que, mise en acte de façon pragmatique, la dynamique du développement rural durable (DRD) serait triplement armée pour relever dans l'urgence les défis lancés à l'humanité sous les coups de boutoir de cette polycrise. D'abord, grâce à une révolution agro-écologique soutenable; la préservation des ressources biologiques (sol, eau, forêt, biodiversité), comme la pérennisation des qualité, diversité et sécurité alimentaires, auraient capacité à réaliser l'objectif de nourrir la population mondiale. Ensuite, grâce à une diversification polyénergétique durable; l'instauration d'une

nouvelle relation à l'énergie, comme la substitution progressive des hydrocarbures par les ressources renouvelables, auraient latitude à amortir la crise énergétique que profile l'épuisement des ressources fossiles. Enfin, grâce à une reconfiguration sociospatiale concentrique; l'articulation des sphères agro-écologique, polyénergétique et sociétale de l'espace rural aurait aptitude à prévenir l'accélération du réchauffement climatique en cours (II).

D'autre part, il apparaîtra que, mise en perspective de manière programmatique, la dialectique du DRD offrirait à concrétiser une renaissance de la ruralité, unique utopie qui semble désormais encore louable (III).

FACTORS RELATED TO THE MEASURE FOR AVIAN INFLUENZA CONTROL AND PREVENTION IN UTTARADIT PROVINCE, THAILAND

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The objectives of this study were to 1) investigate situation of avian influenza and 2) study factors related the measure for Avian Influenza. This area was the bird flu epidemic during January, 2004-March 2005. The bird flu epidemic caused economic damage particularly towards poultry farm business and small-scale poultry farmers. During that time, 1,038,346 numbers of poultry were killed and 7,245 poultry farmers received the compensation with a total amount of 3,662,128.54 US. dollars. Respondents in this study consisted of 304 poultry farmers living in 64 villages of the bird flu epidemic area. Results of the study revealed that more than one-half of the respondents (63.81 percent) stated that their poultry were destroyed because they were in the strict regulations area that without infection. Based on the Avian Influenza knowledge, Most of them had a low level of the knowledge and non-participation in the measure. According to the testing of the causal equations in path model, it was found that the factors "Social Support" ($\beta=0.570^{**}$) and "Participation" ($\beta=0.242^*$) directly affected the effectiveness

in the measure. With regards to the determination of the effective measure which conformed to the community context, the importance of stakeholder, the creation of poultry farmer participation, and community participation in the determination of bird flu prevention process must be held. This truly helped achieve the goal of the measure for bird flu control and prevention leading to further sustainable development.

Keywords: Avian Influenza, Bird Flu in Thailand, Measure for Avian Influenza

THE DEVELOPMENT OF LOCAL PUBLIC POLICY AND MODEL OF ORGANIC FARMING IN THE NORTH OF THAILAND

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The purpose of this study was to investigate the development of local public policy and model of organic farming in the north of Thailand. Data collection was done through related document, expert interview, and case study synthesis from target farmers. Findings showed that organic farming policy was a uni-centric approach having two forms of production: integrated crop based on the local standard and monoculture based on the international standard. Besides, an appropriate local public policy used for the development of organic farming must establish the “policy network” concept which the systems approach. This must be integrated with local wisdom and body of knowledge. Also, participation process must be created and the importance of inter-organization relationship must be held. This includes the relationship among public organization, local government, non-government organization, business sector, academic organization, farmer and consumer network. The community can be the center for the movement of local public policy. For the paradigm of the system, the principle of “sustainable agriculture” can be used based on an “institution” being as the method of managerial administration of the system. Also, “fair trading” is an important goal of the organic farming system.

Keywords: Organic Farming, Sustainable Agriculture, Fair Trade

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RÔLE DE L'AGRICULTURE PRATIQUÉE PAR LA FEMME RURALE DE KABYLIE (ALGERIE) DANS L'ATTÉNUATION DU CHANGEMENT CLIMATIQUE

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En utilisant plus efficacement les ressources hydriques et les variétés résistant aux aléas climatiques et en adoptant de meilleures méthodes de protection intégrée, le mode de production agricole des femmes rurales peut permettre de résister à la variabilité climatique puisqu'elles adoptent des pratiques culturelles en symbiose avec la protection de l'environnement.

En Kabylie (Algérie) les femmes agricultrices rurales augmentent la disponibilité alimentaire par leur travail hautement productif, c'est une réserve de savoir, de connaissances et d'expériences en production vivrière et en protection de l'écosystème. Elles jouent un rôle prépondérant dans la promotion d'une agriculture conservatrice de la biodiversité et des ressources naturelles. Ce sont elles qui sont les plus intensément engagées dans les activités de subsistance des ménages, étroitement tributaires de la qualité et de la disponibilité des ressources naturelles (terre, eau, bois de feu, produits sauvages ayant une valeur économique ou nutritionnelle). Elles contribuent à un développement agricole écologique ou durable qui permet d'atténuer le changement climatique car la majorité d'entre elles font le désherbage manuel, mécanique, la rotation, la jachère et puis les cultures pratiquées sont diversifiées et presque

totalement biologiques tel que l'olivier, les céréales, les arbres fruitiers les cultures maraîchères, et en tant qu'engrais, le fumier, la matière organique et la cendre du bois, éléments naturels sont les plus utilisés et comme méthodes de lutte phytosanitaires, ces femmes s'éloignent des produits chimiques de synthèse et utilisent beaucoup plus la lutte mécanique ou physique.

Mots clés : Changement climatique, production agricole écologique, femme rurale, Kabylie.

Biographie :

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18,000 CHILDREN DIE OF STARVATION EVERYDAY: CANNOT WE SAVE THEM?

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18,000 children and 7,000 adults die of starvation everyday and about one billion people starve at every night throughout the world. Out of them 35 million are in Bangladesh where 28 million representing 20% of the total population are considered 'ultra poor'. Every human being has right to food and other basic needs. Food is the first basic right of every living being in the world. If the respective governments fail to save hungry people for any reason whatsoever, the world leaders including rich people should come forward to save them. In order to mobilize sufficient resources to feed the starved people the rich countries should enhance their yearly contributions to the UN. They should adopt strict measures to stop food wastage in their countries and definitely should come out of protectionism. In USA and UK 63 billion-dollar worth foods are wasted every year. Making bio-fuel is another malpractice which should never be allowed keeping other people hungry. The UN may take initiative to make a special fund to meet this challenge.

Keywords: Children, Food, Fund, Hunger, Waste

IMPORTANCE STRATÉGIQUE DE L'EAU VIRTUELLE DES CÉRÉALES EN ALGÉRIE. CONSTAT ET PERSPECTIVES

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L'Algérie est classée parmi les pays les plus déficitaires en eau. De part son appartenance à la zone géographique du "Middle-East and North Africa (MENA)" et la quasi-totalité de son territoire (87%) classé en zone désertique, sa pluviométrie moyenne annuelle varie de 1600 mm dans l'extrême nord-est à 12 mm à l'extrême sud-ouest. Néanmoins, la pluviométrie moyenne du territoire, toutes zones confondues n'est que de l'ordre de 89 mm. De ce fait, avec moins de 500 m³/habitant/an d'eau renouvelable, l'Algérie dispose de moins de 50% du seuil théorique de rareté fixé par la Banque Mondiale à 1000 m³ par habitant et par an.

Afin d'assurer sa sécurité alimentaire à la fin de la prochaine décennie, il faudra mobiliser entre 15 et 20 milliards de m³/an, tout en sachant que les potentialités du pays ne sont que de 17 milliards de m³/an (ANRH, 2008) et que la mobilisation actuelle n'est que de 5 à 6 milliards de m³/an.

Conscients de l'importance du facteur eau pour une meilleure stabilité politique du pays et pour tout développement économique et social, et dans un soucis d'une meilleure maîtrise des différents aspects du manque d'eau, en général et dans le secteur de l'agriculture en particulier qui consomme environ 70% des eaux mobilisées annuellement, nous essayons de mettre un peu de lumière sur les différents aspects de « l'eau virtuelle » contenue dans les céréales qui constituent, depuis fort longtemps, le principal produit alimentaire d'importation.

En effet, les résultats de notre étude montre que ces dernières années, chaque algérien consomme l'équivalent de plus de 1000 litres d'eau (1 m³) par jour importés et contenus dans sa ration alimentaire journalière.

Mots clés : Eau Virtuelle, Ressources Hydriques, Céréales, Importation De Produits Alimentaires.

STUDY OF NITROGEN FIXATION AND NODULATION IN ANNUAL MEDIC(MEDICAGO RIGIDULA) IN INOCULATION WITH FOREIGN AND INSIDE ROOT SYMBIOTIC BACTERIA

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Annual species of Medicago are important pasture legumes in western parts of Iran. Their productions are affected by suitable soil Rhizobium meliloti strains and environmental conditions. The principle objective of this study was to find a suitable Rhizobium meliloti strain(s) for Medicago rigidula.

in the greenhouse conducted in 2006 to determine nodulation, and nitrogen fixation of M. rigidula inoculated with five Rhizobium meliloti strains (Domestic from Mahabad, M3, M15, M29 and WSM540).

Symbiotic effectiveness was measured by nodule number and nitrogen fixation by subtracting seed N from total plant N in minus-nitrate treatment at the end of the experiment. The Rhizobium meliloti strain "Domestic from Mahabad" was found to be more effective than the M3, M15, M29 and WSM540 in terms of nodulation, dry matter production and N₂ fixation. This may be due to cold resistance of this Rhizobium strain. While nodule number is a very important consideration of symbiotic effectiveness it should be combined with total dry matter and total nitrogen in the evaluation of strains. Rhizobium meliloti strain "Domestic of Mahabad" is recommended for inoculation of M. rigidula in western parts of Iran.

Keywords: M. rigidula, Rhizobium, Nodulation, Biological Nitrogen Fixation.

ANIMAL HUSBANDRY IN FOCUS OF SUSTAINABILITY

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The question of sustainability of agricultural production especially animal production and events leading to its development can be dated back to the second part of the last century. Sustainability is a priority subject matter as it is a core element in our existence and in the survival of the forthcoming generations. The notion of sustainability comprises three aspects: ecological, social and political and economic target systems, which by now have been supplemented with cultural and regional elements including the protection of environment, local traditions, scale of values, cultural and historical heritage. The principles of sustainable development also include the improvement of human and animal health and the maintenance of vital rural communities. The priority notion of sustainability of agricultural production refers also to animal husbandry and especially sheep production. Sheep have contributed substantially to the grassland-based agricultural production in Hungary for centuries. Sheep sector is important in rural areas as the tool of sustainability of animal production. It should also be highlighted that contrary to numerous efforts, the globally difficult process of sustainable development poses almost unsolvable problems for implementers even on local and regional levels. This paper will review briefly the levels of sustainability in the Hungarian animal production with a special regard to sheep production and their content and then points out the most significant economic issues by the application of "SWOT" -

analysis, “problem tree” and “structure of objectives” methods, on the grounds of the received findings.

Keywords: Sustainability, Animal Production, Problem Tree, Objectives Tree, Economic Approach.

IMPACTS OF CLIMATE CHANGE ON FOOD SECURITY IN THE DRIER ZONES OF INDIA

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With millions of poor whose life closely related to climate sensitive natural resources base, India is one of among the countries where the impact of climate change is large. Maintaining food security in a changing climate and fast rising population is a major challenge in India in the new millennium. National economy and life of the majority has been traditionally linked to agriculture, the largest consumer of water. As a result of the change in government policy favouring globalisation and industrialisation, basis of the economy is gradually shifting from agriculture to industries, widening economic imbalance, creating food and water crisis and worsening conflict over allocation. International firms try to monopolise the agricultural sector, affecting the lives of millions of small farmers. Setbacks in agriculture lead to several social issues. Hundreds of farmers have committed suicide in the regions where there was heavy loss in agriculture, due to floods or droughts. Rural unemployment leads to the spreading of terrorism and migration to already overburdened urban centres. Due to encroachment by industries and residential complexes, farm area is shrinking very fast. In addition to all is the change in climate leading to hydrological extremes, threatening the food security, especially in the semi-arid agricultural zones. India has rich cultivable dry zones where developments in agriculture is possible, if some more water becomes available through better conservation and management practices. Change in rainfall intensity and seasonality and change in the onset of monsoons always adversely affect agricultural production.

Studies show that retreat of the Himalayan glaciers has been accelerated recently. In addition to hydrological extremes, this will soon affect flow in the major rivers that cover almost half of the country, leading to severe food and water shortages. Recent government reports show that India is heading towards a food crisis, first time after independence. Study using hydrological model on the changes in water availability in the dry zones in an altered climate show that water availability will be drastically reduced in most parts and this will definitely affect food production in near future. Another two major challenges are the developments in bio diesel projects and the ongoing national river linking programme. Financial reasons including the profit, timely procurement and selling and compel the small farmers to turn towards profitable bio diesel. Though the trend is not strong now, it is likely to change soon. Lining of major rivers may also create water stress in certain areas, especially when the climate pattern changes. Unfortunately, India was too late to develop a climate policy. The present policies and strategies for adaptation are poor. Even the earlier developed policies for water and environment are not properly implemented, because of various social and political issues. India urgently needs to develop an appropriate policy to cope with changes in climate and to beneficially utilize the changes in climate such as changing the varieties, location and timing. Irrigation and water harvesting methods are to be redesigned so as to maximum utilise the available resources. Moreover, there should be an adequate mechanism to properly implement the policy.

Biography:

Dr. K. Shadananan Nair, Senior Research Scientist, Nansen Environmental Research Centre – India. Other responsibilities-national: Course Coordinator, Graduate Course in Water Management, M.G. University, Executive Secretary, Centre for Earth Research & Environment Management (NGO), Kochi, Member, Panel of Experts, Coastal Consultants' Consortium, Amrita Institutions, Kochi, Member, Board of Examiners, MG University. Other responsibilities-international: Member, Coordinated Energy and Water Cycle

Observation Project (CEOP), WCRP/WMO and Member, working group on groundwater, IGWCO (WMO), Member, MWWD Joint Specialist Group Committee. Ph D in Hydrometeorology. Received advanced training in water management, water economics and coastal zone management from reputed International Institutions. Twenty-one years experience in teaching and research in climatology, hydrology and agricultural meteorology. Supervised sixteen theses. and research. Published 73 research papers and participated in more than hundred international events. Member of 16 national/international professional organizations.

PLAN DE GESTION ENVIRONNEMENTALE ET DE SAUVEGARDE SOCIALE (PGESS) SUR LA MISE EN PLACE D'UNE NOUVELLE AIRE PROTÉGÉE (NAP) AMBOHITR'ANTSINGY MONTAGNE DES FRANÇAIS - COMMUNE RURALE MAHAVANONA ET RAMENA - RÉGION DIANA - PROVINCE ANTSIRANANA - MADAGASCAR

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Dans le cadre de la politique du gouvernement malgache à tripler les superficies des aires protégées à Madagascar, et sa politique générale qui est fondée sur « La Vision de Madagascar NATURELLEMENT », un projet de mise en place du NAP à Ambohitr'Antsingy la Montagne des Français dans les deux Communes Rurales Ramena et Mahavanona a été lancé vers l'année 2006.

Le projet a comme objectif global d'instaurer des modes de conservation et de gestion durable de la biodiversité et leur appropriation locale au niveau des trois sites. La pérennisation du projet de création de la NAP nécessite l'élaboration d'un PGESS. Ce Plan prend en considération les Personnes Affectées par le Projet (PAP) et vise à préciser les enjeux et les impacts potentiels de projet de création ainsi que les mesures d'atténuation à prendre au profit de ces PAP.

Pour assurer la conciliation de la conservation de la biodiversité et le développement de la population, la démarche méthodologique adoptée est le processus participatif et l'approche intégrée où tous les acteurs se sont concertés et la communauté est impliquée dans tous les processus.

L'étude est effectuée à trois niveaux : local, communal /intercommunal et régional. L'approche participative a été adoptée durant les quatre étapes : l'analyse socio-économique avant la création; l'Étude d'impact du projet sur le revenu des PAP, sur ses us et coutumes, sur ses activités socio-économique et sur la population en générale; la suggestion des mesures de sauvegarde et la proposition du système de suivi des PAP.

Les mesures de sauvegarde proposent des opportunités pour que chaque acteur puisse améliorer ses conditions de vie, compenser la perte de sources de ses revenus et vivre en sécurité sur leur terroir.

Biographie:

NENANA TSIORY A. Harisoa a fait ses études à l'Université Ankatso/Tananarive au Département DEGS (Droit Économie Gestion et Sociologie) dans la Filière Science Économie. En tant que consultante depuis 2001, elle travaille en partenariat avec des organismes d'appui au développement rural, social et environnemental. Elle effectue actuellement des encadrements des communes et communautés, dans la partie Nord de Madagascar-Antsiranana où elle vit, sur l'élaboration de plans de développement local, sur la pérennisation de projet AGR (Activité Génératrice de Revenu) et sur le plan de gestion des nouvelles aires protégées. Les titres de livre écrits par l'auteur: Rôle de la recherche scientifique dans le développement économique, cas de Centre de Recherche de Kianjasoa/Commune Mahasolo/District Tsiroanomandidy/Province Tananarive (1992) ; The malagasy wedding discours (1999) ; The effect of privatisation in Madagascar (2000) ; Étude socio économique de la mise en place de NAP Montagne des Français/Commune Ramena et Mahavanona/ District d'Antsiranana II/ province Antsiranana (participation avec l'ONG SAGE – 2006) ; Capitalisation des études

socio économiques et juridiques de la mise en place de NAP Ambodivahibe/Commune Ramena et Mahavanona/ District d'Antsiranana II/ province Antsiranana (participation avec la Conservation International – 2007); Plan de gestion environnementale et de sauvegarde sociale – PGESS de la NAP Ambohitra'Antsingy Montagne des Français (2008).

A POLICY FRAMEWORK FOR SUSTAINABLE UTILISATION OF FARMLAND FOR WATERBERG DISTRICT MUNICIPALITY IN SOUTH AFRICA

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This study crafted a policy framework for sustainable utilisation of farmland for Waterberg District Municipality in South Africa. The district, being predominantly agricultural and rural, contention in terms of land allocation among traditional agricultural land uses (conceived as improving and contributing directly to the welfare of many - especially the rural poor) versus contemporary uses such a stroll of golf estates, game ranching and foreign investors (viewed as “elitist and exclusive” largely benefiting the few rich) has become acute over the last few years. The situation was exacerbated by the fact that these challenges were besetting the district at a time when it did not have a policy for sustainable land use. Fully cognisant of this shortcoming, the municipality collaborated with the CSIR Built Environment in generating a policy framework for sustainable utilisation of farmland. The approach entailed a participatory situational analysis identifying all land zones for agricultural purposes in the district and prime agricultural land as well as environmentally sensitive areas. In addition, the policy environment governing the development of agricultural land was thoroughly assessed to ensure compliance, consistency and alignment of the policy with the provincial and national policies. The policy framework was informed by the foregoing

analysis coupled with empirical evidence of the agricultural land uses in the district. The outcome is a policy framework expected to facilitate, guide and influence the sustainable subdivision of farmland taking into account the realities of the existence of competing needs for agricultural land use. The policy framework clearly shows specific areas that may and may not subdivide further, with reasons. Also, it presents a set of guidelines and minimum requirements, to inform decision-making regarding subdivision proposals.

Keywords: Land Policy, Sustainable, Farmland, Waterberg

DROITS HUMAINS, LÉGITIMITÉ DÉMOCRATIQUE ET PRAXIS DE RESPONSABILITÉ AU CŒUR DE LA GOUVERNANCE ALIMENTAIRE ET AGRICOLE DURABLE

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Le but de cette communication est de montrer que la sécurité alimentaire et l'intégration de l'agriculture dans le développement rural durable sont deux questions politico-stratégiques intrinsèquement liées et que leur effectivité dépend d'une gouvernance démocratique et légitime ayant comme gouvernail les droits humains et comme pilote la praxis de responsabilité. Les droits humains portent en leur sein les significations pertinentes d'un cadre programmatique d'action dont l'appropriation identitaire, stratégique et structurelle par les acteurs publics/privés, nationaux/internationaux, gouvernementaux/non gouvernementaux conduit à un mode de régulation institutionnelle et d'un mode d'autorégulation comportementale tant au niveau local qu'au niveau global. La praxis de responsabilité détermine la conjonction vertueuse de l'appropriation des droits humains, des régulations transformatrices et des remises en cause des représentations déformatrices et des intérêts autocentriques. Ainsi appréhendée, la praxis de responsabilité est à la fois un outil d'effectivité du droit humain à l'alimentation et

un outil de pilotage d'une gouvernance alimentaire et agricole intégrée dans le développement durable en général et rural en particulier.

Mots-clés : droits humains, démocratie, responsabilité, gouvernance alimentaire, agriculture, développement rural durable

Biographie:

Dr. Hélène Nikolopoulou est juriste, sociologue et aître de Conférences à l'Université de Lille 3-France. Elle est également chercheur-membre du Centre d'Études du Développement International et des Mouvements Économiques et Sociaux (CEDIMES-Paris) et membre du conseil scientifique du Centre Nord-Sud de Recherches en Sciences Sociales (NRCS, Agadir-Maroc).

SUSTAINABLE RURAL DEVELOPMENT AND PARTICIPATORY APPROACH BY ON-FARM WATER MANAGEMENT TECHNIQUES

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Food security is a human right, and its provision is a common responsibility. There is a serious threat to humanity by shortage of irrigation water. Sustainability in rural development is purely subjected, beyond the ethics, gender and races discrimination. This study involved participatory approach adopted by On-Farm Water Management (OFWM) by providing Social mobilization, technicalities and capital share for watercourse construction and improve capacity building and empowerment of farmers to combat poverty. Participatory approaches made it easy if properly implemented. It was noted that 33% water was saved by improving watercourses, so that 25% arid area can be brought under cultivation by saved irrigation and it is possible to generate employment to sustain rural development and 30% employment is generated, in this way by pooling all these efforts, it can be believed more than 50% economic situation can be

improved in rural areas and sustained rural development is ensured. It was also concluded by the study that increase in irrigation increased the cropping intensity (Apparent and real water productively, AWP and RWP as defined by Kassam and Smith, 2001) and finding of (Jalota, et al 2006) In a global context by aligning participatory opportunities the elimination of poverty, attainment of peace may be achieved by the rational and sustainable use and management of natural resources. The current world food and energy crises and the human and environmental impacts of globalization and climate change call for a rethinking of development in agricultural and rural development in more specific way. **Keywords:** Sustainability, Food security, Participatory, Social mobilization, Capacity building

Biography:

Dr.Ijaz Rasool Noorka is Assistant Professor in University College of Agriculture, University of Sargodha, Pakistan, has long experience in On-Farm water management techniques. Currently he is working on water stress in different crops. He is founder and Secretary General, Pakistan Agricultural Scientist Society (PASS). The PASS is regularly publishing International Journal of Agriculture and Applied Sciences (IJAAS) and Monthly Magazine, "Doab". Dr.Ijaz is working as Editor and Chief Editor respectively.

ACCEPTABILITÉ DE LA LUTTE ÉTAGÉE CIBLÉE COMME MODE DE PROTECTION PHYTOSANITAIRE DU COTON DANS LA ZONE PILOTE DE CMIA AU BÉNIN

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Résumé : Ce papier présente les résultats d'une étude conduite sur l'acceptabilité de la lutte étagée ciblée (LEC) comme mode de protection phytosanitaire du coton dans la zone pilote de Cotton made in Africa au Bénin. L'objectif de cette étude est d'analyser les comportements des producteurs vis-à-vis de la

lutte étagée ciblée comme mode de protection phytosanitaire du coton. Pour y arriver des enquêtes ont été réalisées auprès de 160 cotonculteurs dans quatre communes de la phase pilote du projet. Le modèle probit a servi pour l'analyse des déterminants de l'acceptation de la LEC tandis que l'analyse systémique et les discours des acteurs ont été utilisés pour analyser la perception paysanne de la LEC. Il ressort des résultats de l'étude que quatre étapes ont été identifiées dans le processus de l'acceptation de la LEC : prise de connaissance de l'existence de la LEC, intérêt manifesté par les paysans, évaluation théorique par les producteurs et le test. Quant aux facteurs déterminant, il ressort du modèle d'estimation qu'au seuil de 1%, la disponibilité en sherphos ($c = 1,28$) est le facteur déterminant l'acceptation de la LEC. Ensuite, le revenu issu de la vente du coton ($c = 6,98e-06$), la formation des paysans à l'utilisation de la LEC ($c = 1,43$) sont les facteurs déterminant l'acceptation de la LEC au seuil de 5%. Concernant la perception paysanne, la LEC est pour certains paysans, une technique venue pour les faire sortir de leur crise technique et économique. L'efficacité des produits de base en l'occurrence le sherphos est le moteur de cette vision positive qu'ont les paysans de cette innovation. Cependant, le retard qu'accuse l'approvisionnement des paysans en produits LEC, la mauvaise qualité des insecticides, le retard dans le paiement de l'argent coton LEC sont les facteurs qui entravent l'acceptation de la LEC.

Mots clés : Acceptabilité, Lutte Etagée Ciblée, Protection phytosanitaire du coton, Perception paysanne, Bénin

Biographies :

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INVENTAIRE ET ÉVALUATION DES SOUCHES SYMBIOTIQUES CHEZ HÉDYSARUM CORONARIUM L. DANS LES SOLS D'ALGÉRIE, ESSAIS D'INTRODUCTION, AVEC INOCULATION, EN ZONES SEMI ARIDES DE L'OUEST ALGÉRIEN

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Les légumineuses d'une manière générale ont la capacité d'établir des symbioses fixatrices d'azote atmosphérique avec des bactéries du sol communément appelées Rhizobium. Cette fixation biologique de l'azote par les légumineuses permet d'améliorer la fertilité des sols, de limiter l'utilisation des engrais azotés et d'atténuer leurs conséquences néfastes sur l'environnement en particulier celle de la pollution des nappes phréatiques.

D'autre part, le développement de l'élevage repose en grande partie sur la disponibilité des ressources alimentaires constituées par les fourrages cultivés, les résidus de récolte, les sous-produits agro-industriels, les parcours et les arbustes fourragers. Parmi ces ressources, les fourrages et les parcours occupent une part importante mais la contribution des fourrages aux besoins du cheptel est faible et va en diminuant en raison de l'utilisation abusive des parcours et de la réduction des surfaces fourragères semées. Il est donc important de réhabiliter les cultures fourragères et pastorales naturelles qui restent peu étudiées et encore sous-exploitées.

Les légumineuses fixent l'azote de l'air et, à ce titre, sont très avantageuses pour le paysan qui a toujours dû rechercher des sources d'azote qui sont le plus souvent coûteuses sur le plan financier et sur le plan environnemental.

En privilégiant les légumineuses dans son assolement, l'agriculteur réduit sa consommation d'énergie, tout en améliorant la fertilité des sols ainsi que le bilan économique et environnemental de son exploitation agricole.

Au niveau mondial, la demande de nourriture va augmenter et la Fixation Biologique de l'Azote « FBN » peut contribuer significativement à l'augmentation de la production de plantes protéagineuses et/ou oléagineuses comme le soja.

Plus généralement, les pays développés introduisent dans leur agriculture des contraintes liées à la protection de l'environnement, avec une meilleure utilisation des intrants chimiques, voire leur remplacement partiel par des "intrants biologiques".

Il est très probable que parmi les outils à développer pour restaurer et/ou améliorer le fonctionnement des sols, une "ingénierie écologique" trouvera sa place.

Cette approche serait aussi applicable dans les pays en développement qui doivent intensifier leur production agricole sans avoir les moyens de recourir aux intrants traditionnels. Les rhizobia, du fait de leur utilisation à grande échelle depuis un siècle, de leur innocuité vis-à-vis de l'environnement et de la spécificité de leur niche écologique sont le modèle de choix pour construire les bases de cette ingénierie écologique.

Ceci est d'autant plus vrai que les rhizobia ont d'autres capacités que la seule fixation d'azote : PGPR, solubilisation de phosphates, dégradation de composés organiques (phytosanitaires), capacités peu explorées jusqu'à maintenant, et qu'ils peuvent de plus être facilement introduits dans le sol via l'inoculation.

La FBN et les légumineuses offriront aussi des possibilités de diversification. Au niveau maghrébin le pourcentage de terres cultivées en légumineuses devra augmenter afin de diminuer notre dépendance vis-à-vis des importations, d'améliorer le ratio de consommation en protéines et de stabiliser la consommation d'engrais azotés coûteux en énergie fossile.

Ces enjeux économiques se traduisent par un regain d'intérêt pour la FBN et une demande forte d'augmentation de son utilisation et de son amélioration. Conforter part les avancées scientifiques impressionnantes réalisées ces

dernières trente années dans ce domaine, les priorités restent :

- d'utiliser les connaissances existantes au niveau du terrain,
- de développer une approche agronomique,
- de sélectionner les plantes et les souches de rhizobia et de les intégrer dans les systèmes de cultures les mieux adaptés et enfin,
- de développer l'ingénierie génétique au service du développement de ces cultures symbiotiques.

Elles ne seront atteintes qu'avec une augmentation de connaissances sur la FBN.

Une approche d'écologie fonctionnelle des rhizobia devra être associée aux travaux des agronomes, des éco-physiologistes et des améliorateurs de plantes pour progresser plus rapidement dans l'amélioration et de l'utilisation de la Fixation Biologique de l'Azote – FBN.

REFORESTATION-QUALITY IMPROVEMENT OF CONTAMINATED MINING SOIL

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Most sub-Saharan countries are influenced by either drought or heavy rainfall, poor soil quality and anthropogenic and industrial impacts. South Africa is one of the countries in the region in which the greatest impact of mining on the environment is seen. The environmental impacts are obvious and need to be addressed during each phase of environmental planning, especially in rural development and agriculture sectors.

The environmental impacts of mining in South Africa are, in general, increased concentrations of heavy metals and changes of pH in both impacted soils and especially in water. Mining processes coupled with weather conditions affect the agricultural and forestry sector by impacting water and soil quality.

The addition of different organic fertilizers, as a nutrient source and soil ameliorant in

contaminated platinum and gold tailings, allowed the indigenous tree species - *Searsia lancea* (L.F.) F.A. Barkley to grow despite the high levels of contamination. In a laboratory trial with both types of tailings the combination of different fertilizer and cultivation techniques allowed for a reduction of 50% in heavy metal contamination and increase of ~ 140% in microbiological activity after treatment.

These results of this soil amelioration show a sustainable use of trees combined with fertilizer to decontaminate mine soil while producing a resource (wood), lowering carbon dioxide and preventing contamination of surrounding areas by aeolian transport (sandstorms etc.).

Keywords: Mine soil, Sewage sludge, pH buffering, Heavy metals, Biological rehabilitation

Biography:

Dr. Pollmann studied civil engineering majoring in water-supply, particularly environmental engineering and technical waste-management as well as additional environmental management techniques at the Gottfried Wilhelm Leibniz University of Hannover in Germany from 1995 to 2000. From 2001 to 2006 he worked as a research scientist at the Leuphana University of Lüneburg. In October 2006 Dr. Pollmann finished his Doctorate (Dr.-Ing. / PhD) in the field of environmental-informatics at the Technical University of Darmstadt, Germany. From January 2007 he works as a post-doctoral research fellow in the field of waste reduction and water purification at the Department for Environmental Sciences and Development, North-West University, Potchefstroom Campus in South Africa.

Prof. van Rensburg started his academic career by obtaining his BSc, BSc Honns and MSc (all cum laude) at the PU for CHE (now NWU). Up to 1994 with the completion of his PhD he focused on understanding and quantifying plant responses to environmental stress, i.e. what plants experienced as being stressful environments and how they responded physiologically to be able to cope with the stressor/s. Up to his appointment as Director of the now Research Unit for Environmental

Sciences and Sustainable Management he has conducted numerous research projects in various climatic regions (locally and internationally) and on a large number of different mine discard materials for various large.

« L'APPROCHE TERROIR », UNE COMPÉTENCE À VISER DANS UNE PERSPECTIVE DE DÉVELOPPEMENT AGRICOLE DURABLE

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Les enjeux politiques, économiques, sociaux et culturels liés, d'une part, à la mondialisation des échanges commerciaux, d'autre part au besoin de développement local des territoires de vie, remettent sur le devant de la scène la notion de terroir, dont les usages ne se limitent plus depuis longtemps aux produits agricoles typiques d'une région. L'internationalisation du mot terroir est même devenue une réalité.

Si les démarches de terroir peuvent représenter un véritable levier pour le développement durable de nombreux territoires ruraux, il est essentiel que la notion de terroir soit appropriée tant par les professionnels de la production des produits et des services de terroir que par les consommateurs et les citoyens, afin de rompre avec cette grande confusion quand on parle de terroir, chacun ayant sa propre représentation.

Des premières recherches didactiques mettent en évidence l'intérêt d'enseigner la notion de terroir. D'une part, les acteurs vivant sur les terroirs revendiquent l'importance qu'il y a à transmettre la notion aux nouvelles générations. D'autre part, la transdisciplinarité et la complexité de la notion ne peuvent pas faire l'objet d'une définition univoque, sans se référer à des situations bien contextualisées.

Aussi, l'appropriation de la notion de terroir devra faire l'objet de stratégies éducatives différenciées, selon les publics à former et selon les compétences visées. Pour les acteurs du terroir, une « approche terroir », permettant la connaissance des ressources locales à activer

et la compétence de valorisation de ces ressources, pourrait constituer un modèle pour un module de formation répondant au besoin de développement des compétences des acteurs.

Mots-clés : Éducation Au Terroir ; Dynamique de Développement Local ; Transmission des Savoirs ; Transdisciplinarité ; Stratégie Éducative.

Biographies :

Philippe PREVOST est Ingénieur en chef du Génie rural, des Eaux et Forêts du Ministère chargé de l'Agriculture, et Docteur en Didactique des Sciences. En dehors de sa responsabilité administrative à Montpellier SupAgro, il développe une activité de chercheur au sein du Laboratoire interdisciplinaire de recherches en didactique, éducation et formation de l'Université Montpellier 2. Son axe de recherche concerne la transmission des savoirs agronomiques, et c'est dans ce cadre qu'il s'intéresse à la transmission du concept de terroir.

Patrice LALLEMAND est Ingénieur d'étude à Montpellier SupAgro. En tant qu'œnologue, il a enseigné le terroir durant une dizaine d'années auprès des filières techniques de l'enseignement agricole français. Dans le cadre de ses missions à l'international, il a coordonné divers programmes européens sur le thème de la valorisation des productions de terroir ; il développe aujourd'hui une activité de recherche sur la transmission du concept de terroir, en partenariat avec l'Université d'Agadir.

CLIMATE CHANGE, SEASONALITY AND HUNGER: THE SOUTH ASIAN EXPERIENCE

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Seasonality remains a prime cause of food scarcity and hunger in the rural areas of South Asia with millions of people facing recurring food distress each year. With the impacts of climate change becoming apparent, the probability of sharpening food insecurity is high. Climate change brings with it increasing

uncertainty. It is no longer a specific season which the farmer must gear up to face, but also the uncertainty regarding the advent of the season, its duration and the intensity of the impact in terms of drought, rainfall, flooding, etc. To equip the small and marginal farmer to cope with the additional burden of seasonal uncertainty, agriculture policy and welfare measures both need to be tailored to fit the changing situation.

This paper will attempt to review the impacts of seasonality on food security in the rural areas of South Asia, project the increasing food insecurity which may result from climatic uncertainty, assess the existing policies/interventions to provide food security, and point out the modifications required to face the changing situation.

Keywords: Climate Change, Seasonality, Food Insecurity, Hunger, South Asia

Biography:

Dr. Nira Ramachandran is an independent development consultant and also holds the post of Director, Research and Training, Earthcare Foundation, New Delhi. A Ph.D in Regional Development from the Jawaharlal Nehru University, New Delhi, she has taught at several prestigious academic institutions. She also conducts training programmes in the areas of food security, primary education, PRA and project management and has to her credit several publications including 'Towards a Food Secure India: Issues and Policies (2003) and Coming to Grips with Rural Child Work – A Food Security Approach (2002).

EFFET DE LA BENTONITE SUR LES SOLS SABLEUX DES RÉGIONS ARIDES, ÉTUDE DE COMPORTEMENT D'UNE ASSOCIATION BLÉ POIS CHICHE

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Les sols sableux du plateau de Mostaganem présentent un très faible taux en argile. Ils sont

caractérisés par une fertilité très réduite et une capacité de rétention en eau faible. L'addition de la bentonite dans ces sols et la mise en culture du blé dur, en association avec le pois chiche, constituent deux stratégies éco physiologiques pour réhabiliter leur aptitude agricole. L'expérimentation s'est déroulée en deux étapes, au cours de la première étape les analyses des caractéristiques physiques et chimiques des substrats étudiés sont réalisées en laboratoire, une deuxième étape concerne l'étude agronomique conduite en conditions contrôlées dans une serre au département de biologie de l'Université de Mostaganem. Cette étude est menée sur deux espèces : une céréale, le blé dur variété locale (Waha) et une légumineuse, le pois chiche variété (ILC 3279), sur substrat bentonite à la dose de 10 %. La quantité de bentonite ajoutée au sol traité correspond à des doses exprimées en pourcentage du poids sec du sol. Les pots remplis de substrat sont en nombre de 12. Ils sont disposés selon la méthode des blocs aléatoires complets à trois répétitions. Les stades végétatifs étudiés du blé dur concernent la levée, 2 feuilles, 3 feuilles, début de tallage. Des mesures de hauteur de la tige et de la surface foliaire des parties aériennes sont réalisées afin de connaître l'incidence du traitement de la bentonite et de l'association blé dur + pois chiche dans ces sols sableux. Pour chaque stade végétatif, la teneur en azote de la plante est quantifiée. Les prélèvements des échantillons de sols nécessaires aux analyses, sont effectués à partir des pots. La nutrition minérale de la plante est apportée en utilisant la solution nutritive de Hoagland (1938). L'arrosage à la solution nutritive est apporté dès le stade levée. Les volumes d'irrigation sont déterminés par différence entre les quantités d'eau apportées avant l'arrosage et celles récupérées après 24 heures de décantation. Les variations des teneurs en azote total du blé dur cultivé dans des substrats amendés à 10% ou non en bentonite au cours du développement du blé dur en monoculture et en association avec le pois chiche sont analysées. Les résultats révèlent que les teneurs en azote total du blé dur sont nettement élevées aux stades trois feuilles et tallage, dans le sol portant l'association blé dur

+ pois chiche. Par contre, elles sont identiques aux stades levée et deux feuilles dans le blé dur des deux systèmes de cultures. Les résultats montrent également l'effet positif du facteur traitement à 10% de bentonite sur la teneur en azote total de la plante quel que soit le stade et le système de culture.

Mots clés: Sol sableux, Bentonite, zones arides, Association blé dur + pois chiche, caractérisation physico chimique du sol.

Biographie :

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A KNOWLEDGE APPROACH TO SUSTAINABLE AGRICULTURE

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The Dutch agricultural sector is facing major challenges which can affect the elements of their enterprise. One of the major challenges is the adoption of sustainable practices within agriculture. Farmers are becoming entrepreneurs because of the pressures acting on the overall agricultural system. Therefore, entrepreneurship is an important factor in the agricultural sector to overcome those challenges. Hence it is relevant to investigate the knowledge possessed by the main entrepreneurial actors in agriculture: farmers. This project studies the way that farmers structure their knowledge and it also looks at the knowledge transfer process among farmers and some of the stakeholders that are related with them. The study of

entrepreneurship includes the study of the structure and processing of knowledge. Farmers possess some knowledge about their enterprise but they also receive knowledge from different sources. However it is not clear what farmers do with the knowledge they receive and if farmers understand that knowledge. It is not clear either if the knowledge farmers' use is suitable to adopt sustainable practices.

Keywords: Agriculture, Cognition, Knowledge, Netherlands, Sustainable.

Biography:

Jesús Rosales studied Chemical Engineering at the National University of Mexico. He has worked for Degremont and for Owens Corning. In 2007 he received his Master of Science in Energy and Environmental Sciences. Since December 2007, Jesús is conducting a PhD about Knowledge and Innovation in Sustainable Agriculture at the University of Groningen under the supervision of Prof. René Jorna.

MEMBRANE FROM MOROCCAN ABUNDANT NATURAL CLAY FOR WASTE WATER REUSE: A NEW ERA OF SUSTAINABLE DEVELOPMENT FOR DEVELOPING COUNTRIES

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To sustain is 'to continue without lessening' and 'to allow to flourish now and in the future'. This is a vital concept for the water industry, as well as having special meaning for the application of membrane technology to that industry.

However, the development of membrane processes to treat wastewater is generally limited because the price of the membranes is too expensive, which is particularly true for the inorganic membranes. One of the challenges for future development of the inorganic membranes will be to produce low-cost membranes with high flux performance to treat large volumes of liquid effluent.

In This work, we discuss a sustainable process to develop a new membrane from the abundant natural Moroccan clay. We discuss also sustainability and membrane processing for wastewater reuse.

Keywords: Water Reuse; Sustainability; Natural Moroccan Clay; Sustainable Growth; Membranes.

SÉCURITÉ ALIMENTAIRE ET CHANGEMENT CLIMATIQUE: UNE QUESTION DE SANTÉ PUBLIQUE ET DE SANTÉ ÉCONOMIQUE

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Le changement climatique représente un nouveau risque pour la santé publique et modifie la façon dont les pouvoirs publics doivent envisager la santé des populations. Le facteur déterminant de l'insécurité alimentaire dans les pays en développement demeure incontestablement le changement climatique. En effet, un grand nombre de pays sont depuis quelques décennies confrontés à une variabilité inter et intra-saisonnière marquée par une évolution tendancielle à la baisse de la pluviométrie dont les conséquences sur la sécurité alimentaire sont souvent catastrophiques.

Ces menaces environnementales représentent un risque majeur pour la santé des populations et contribuent à l'émergence de pathologies diverses (maladies cardio-vasculaires et respiratoires, cas de cancers, malformations congénitales, maladies infectieuses, etc.) et autres contaminations d'origine hydrique et alimentaire.

Les effets du changement climatique sur la santé humaine se répartissent de façon inégale sur la planète. Il existe des populations plus vulnérables que d'autres, notamment celles qui vivent dans les pays en développement, dans les états insulaires, dans les zones côtières, arides ou de haute montagne et densément peuplées. Les déplacements de populations sont de plus en plus fréquents. Les extrêmes

de température (vagues de froid et de chaleur) occasionnent des décès supplémentaires chez les personnes âgées, les personnes souffrant de maladies cardiovasculaire ou respiratoire, les nouveau-nés et les personnes ayant une santé fragile. Les phénomènes météorologiques exceptionnels ont aussi une incidence sur la santé mentale des populations et des travailleurs et contribuent à la détérioration de l'infrastructure de santé publique et du potentiel économique des pays affectés.

Cette communication se propose d'examiner les conséquences sanitaires, socio-économiques et politiques des phénomènes évoqués plus haut et de présenter les options disponibles aux pouvoirs publics pour y faire efficacement face.

Mots clés: Santé Publique, Sécurité Alimentaire, Changement Climatique, Économie de la Santé, Pays en Développement.

Biographies :

Dr. Sanni Yaya (Ph.D.) est économiste de la santé et du développement et professeur à l'Université d'Ottawa au Canada. Il a enseigné à l'Université Laval, à l'Université du Québec à Montréal et à l'École nationale d'administration publique et a été chercheur postdoctoral à l'Université Yale et chercheur invité à l'Université de New York aux États-Unis. Auteur d'une dizaine de livres et de plusieurs articles, il est également Rédacteur en chef de la Revue de l'innovation, directeur de collection aux Éditions Publibook et Directeur de collection aux Presses de l'Université d'Ottawa.

Dr. Mohamed Behnassi est Professeur à la Faculté des Sciences Juridiques, Économiques et Sociales de l'Université Ibn Zohr d'Agadir et Directeur du Centre Nord-Sud de Recherches en Sciences Sociales (NRCS : nrns.synthasite.com). Il est titulaire d'un Doctorat en Sociologie des Relations Internationales (thème : Les négociations environnementales multilatérales : vers une gouvernance mondiale pour l'environnement) ainsi que des articles scientifiques et des communications présentées dans des congrès internationaux portant sur les questions de gouvernance, de développement durable, de

responsabilité sociale et de droits humains dans une perspective Nord-Sud. Il est aussi consultant en RSE et organisateur de deux Congrès internationaux. behnassi@gmail.com

ENERGY EFFICIENCY, METHANE OUTPUT, REQUIRED CARBON SEQUESTRATION AREA AND WATER PRODUCTIVITY IN EXTENSIVE AND SEMI-INTENSIVE BEEF PRODUCTION IN SOUTH AMERICA - A COMPARISON OF ECOLOGICAL CURRENCIES

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Beef is one of the most important food commodities. This is reflected in the high international trade volume. Global demand for beef has been rising consistently over the past five decades. About one third of all agricultural land on the globe is wholly or partially occupied by beef production systems. Beef production systems have a bad reputation in terms of environmental impacts from land area and total water requirements to greenhouse gases (GHG) emissions. The paper examines three different evaluation tools applied to extensive and semi-intensive beef production systems in South America. System behaviour was tested for the impact of interventions on energy efficiency and methane output by using simulation models. Compensatory carbon sequestration area was calculated for 31 beef production enterprises with three levels of production intensity using a "carbon footprint" type of accounting. Evaluation of water productivity was carried out by estimating "virtual water contents" for three levels of production intensity typically found in South America. Results were conflicting. Energy efficiency was not improved through intensifying interventions. Likewise there was no reduction in methane outputs when yield enhancing interventions were applied. On the other hand intensification had a marked positive effect on carbon footprint, i.e. a significant reduction of the required carbon sequestration area. Yield enhancing measures had no effect in either way on water

productivity with the exception of increasing nutrient densities in the diet, which were found to improve water productivity but not energetic and or economic efficiency. The complexity of the findings points to the necessity to develop an evaluation system which takes into account conflicting responses by weighted assessment of the different environmental impacts against different economic and political backgrounds.

Keywords: Beef production, South America, environmental impact, greenhouse gases, water footprint

Biography:

Horst Juergen Schwartz graduated in Agricultural Sciences at Technical University Berlin, Germany, in 1970, and obtained a Ph.D. in Animal Science at the same institution in 1970. He was a lecturer at University of Nairobi, Kenya, a research scientist within the UNESCO-Man and the Biosphere Programme, and a Professor in Animal Science at Technical University Berlin. From 1990 until his recent retirement he was Professor of Livestock Ecology at Humboldt University of Berlin, Germany.

Cristian R. Feldkamp graduated in Agricultural Engineering at Universidad Nacional de Entre Rios, Argentina, in 1998. In July 2004 obtained the title of “Doctor rerum agriculturarum” from the Humboldt University in Berlin, Germany. Currently, C. Feldkamp is an associate professor at the Universidad de Concepción del Uruguay, Argentina.

Davi J. Bungenstab graduated in Veterinary Medicine at Universidade Federal do Mato Grosso do Sul in 1994, specialized in Agribusiness Management at the Universidade Federal de Lavras in 1996 in Brazil. In July 2004 obtained the title of “Doctor rerum agriculturarum” from the Humboldt University in Berlin, Germany. Currently, D. J. Bungenstab works at the Universidade Estadual de Mato Grosso do Sul in Central-Brazil developing research work focused on environmental impacts of cattle production.

SIGNIFICANCE OF SUSTAINABLE AGRICULTURE IN THE MAINTENANCE OF

AGRO-ECOSYSTEM FOR RURAL DEVELOPMENT AND FOOD SECURITY

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Farming activity is taken up in an eco-system called agro-eco-system. An agro-eco-system is an integrated unit of soil – water – crop – living beings existing in harmony with a well balanced equilibrium of food chains and their related energy balances. The co-ordination between these components and integrative forces acting for/against the harmony are two essential features of the agro-eco-system. In this perspective, sustaining an eco-system is tantamount to achieving something more than what is achieved in sustaining the soil fertility and crop yields. An eco-system is a large domain embodying fertility domain and crop domain. Hence, the sustainability in eco-system leads to sustainability of both fertility and crop yields in broader sense over a long period of time. It is absolutely essential to sustain an eco-system not only for an objective of achieving the sustainable crop yields and fertility but also because, an eco-system leads to more stability in the nature by establishment of more integrated relations between components of eco-system. Hazards due to use of synthetic and chemical materials in nature can only be minimized by sustainable eco-system.

Biography:

Rakesh Singh Sengar: He is working as Associate Professor at Sardar Vallabh Bhai Patel University of Agriculture and technology, India. He obtained his Phd in 1992 from Rohilkhand University, Bareilly in plant sciences with fellowship from CSIR. He completed his MSc in botony from the same university in 1988. He has a experience of teaching and research of several years. He has expertise in plant physiology and biochemistry, tissue culture technique, organic farming etc.

Kalpana Sengar: Kalpana Sengar is working as a senior research fellow at tissue culture lab, in college of biotechnology, Sardar Vallabh Bhai Patel University of Agriculture and technology,

India. She is Pursuing her Phd from Banasthali Vidayapeeth University, Rajasthan In Biotechnology. She completed her postgraduation MSc Biotechnology in with distinction from Chaudhery Caran Singh University in 2006. She is hardworking, sincere and dedicated to science field.

Ankush Innani: He is persuing his Masters of Science majoring in Industrial & Commercial Biotechnology, University of Newcastle, United Kingdom. He has done his Bachelor of Science majoring in Biotechnology, MGM College, India in 2006 in First Class with Distinction. He is very Hardworking and Sincere student .

TURNING ADVERSITY INTO ADVANTAGE FOR FOOD SECURITY THROUGH IMPROVING SOIL QUALITY OF FARMERS FIELDS FOR BETTER AGRICULTURE SERVICES

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Farmers face challenge in meeting increasing food demand for their families and their livestock from saline soils. Reasons being water scarcity, poor understanding of the problem and financial constraints, and above all deteriorated soil and water resources quality, where salinity of groundwater and soil has increased sharply during the last two decades. Owing to this menace many farmers abandoned agriculture on their lands. Rather than wringing their hands in despair over these problems, the scientists of Dubai based International Center for Biosaline Agriculture (ICBA) are turning adversity into advantage by providing technical support to poor farmers through National Agricultural Research Systems (NARS) of respective countries in improving soil quality for better agricultural services. These practices includes from initial soil assessment for better understanding of soil resource to plan for a site specific soil management plan (site preparation, use of soil amendmets, leaching excess salts, salinity mapping and monitoring, nutrient management and other cultural practices). The initial plan help farmers to take necessary

actions to improve and maintain soil health during the course of crop growth and to assure that soil quality is not degraded and the environment is saved. This way farmers can earn good money through improving soil health for future agriculture. In this paper experience in soil management issues in general and soil salinity in specific will be shared with conference participants, who, may utilize this scientific based approach in their countries to help farmers mange salinity menace, raise income through improving their livelihood. The experience build in ICBA in state-of-the-art salinity monitoring will be shared with conference participants, where both conventional and modern salinity assessment and monitoring techniques (Electromagnetic induction-EMI (EM38), salinity probes, automated dynamic salinity logging system (ADSLS), and conventional methods will be discussed and results presented. The presentation is equally important both from capacity building and resource management point of views.

Keywords: Adversity; Food Security; Soil Quality; Salinity Monitoring; Better Agriculture

Biography:

Dr. Shabbir A. Shahid earned Ph.D degree from University of Wales, Bangor United Kingdom in 1989; B.Sc Hons and M.Sc Hons (Soil Science) from University of Agriculture Faisalabad Pakistan in 1977 & 1980 respectively; Over 30 years experience (Pakistan, UK, Australia, Kuwait & United Arab Emirates) in soil related R & D activities. Currently Vice President of World Association of Soil and Water Conservation (Middle East).

Dr. Mahmoud A. Abdelfattah is graduated from Cairo University, Egypt on 1991, M.Sc. (Soil) from ITC, the Netherlands, Ph.D. (Soils), from Cairo University, Egypt. Worked as lecturer at Cairo University, Egypt and in the United Arab Emirates University and now holding Soil Scientist position at the Environment Agency - Abu Dhabi.

THE SELF-RELIANT COUNTRY: SUSTAINABLE AGRICULTURAL POLICY FOR AUSTRALIA?

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Contemporary Australian agricultural and food policy is strongly neo-liberal, with market forces the basis for resource production, consumption and distribution. The national policy framework endorses continually increased levels and scales of production by a self-reliant farming sector that is highly responsive to market signals. Insufficient consideration is given to the unpaid environmental, social, community and human-health costs resulting from industrial-scale agriculture.

This paper examines how neo-liberalism has shaped *Creating our future: agriculture and food policy for the next generation* (2006): the key Australian Government policy document on these topics. The Report was developed to ensure the profitability, competitiveness and sustainability of future Australian agriculture and food production. The policy platform is firmly focused on the first two terms: 'profitability' and 'competitiveness'. Neither the meanings nor the intentions of 'sustainability' and 'sustainable agriculture' are specified. The national policy framework endorses continually increased levels and scales of production by a self-reliant farming sector that is highly responsive to market signals. Insufficient consideration is given to the unpaid environmental, social, community and human-health costs resulting from industrial-scale agriculture. The current framework does not actively support environmental and social sustainability in rural Australia. Eventually, this will affect even the economic sustainability of the sector. If sustainability is to become a meaningful term in the future, Australia will need to embed ecological, economic, social and health needs into agricultural policy. It will need to move beyond neo-liberalism to a definition of sustainable agriculture that goes beyond short-term profit.

keywords: Sustainable agriculture, Agricultural policy, Neoliberalism, Australia.

Biography:

Jane Shepherd lectures in Landscape Architecture. Her current design research project: FOOD LAB: Food and Landscape Architecture Bureau investigates food production and landscape settlement patterns. Jane's work considers relationships between policy platforms, land use outcomes and the effects on ecological, community and human health and is informed by the implications for food justice that emerge from agricultural and food production systems.

SUSTAINABLE WATER MANAGEMENT FOR IRRIGATED RICE PRODUCTION

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Water is necessary for rice cultivation especially for irrigated rice (lowland, deepwater rice). Insufficient water supply is possible to obstruct rice growing rate and yield. However, anaerobic rice systems produced greenhouse gases emission cause of global warming problem. Therefore, introduce aerobic rice system is one of interesting option to reduce greenhouse gases emission and maintain water resources in ecosystem. In this study, the DNDC-rice model was used to validate methane (CH₄) emission against field observations under various water management regimes included continuously flooded, mid season drainage, multiple drainage and local farmer practice in irrigated rice cultivation area in Thailand. The result shown CH₄ emission from drainage field was lower than continuously flooded management. Longer field drainage presented high potential for CH₄ reduction. Rice yield under four water managements were not different, however, rice growth rate and water requirement was dissimilar. The water consumption under mid season drainage treatment is reduced by 5.3% and rice grain yield is increased by 5% compared to conventional water management from study site.

Model simulation can be explained phenomenon of electron donor/electron

acceptor in rice soil. The contents of electron acceptors strongly affect CH₄ emission from rice fields, particularly under alternative forms of water managements. The results from field experiment and modeling were suggested that field drainage conducted during growing season is one option to mitigate CH₄ emission but maintain rice grain yield.

Keywords: Greenhouse Gas, Model, Rice Production, Water Management, Yield

Biography:

Miss Kruamas Smakgahn graduated Ph.D. in Environmental Technology from The Joint Graduate School of Energy and Environment, King Mongkut's University of Technology Thonburi, Bangkok, Thailand (January 25, 2005). After finished Ph.D. she was granted by Japanese government for Eco-Frontier Fellowship and she joined Greenhouse Gas Emissions Team, Carbon and Nutrient Cycles Division, Department of Global Resources, National Institute for Agro-Environmental Sciences, Tsukuba, Ibaraki, Japan for 2 years. Now, she works for governmental university in Thailand as Lecturer at Department of Science, Faculty of Liberal Arts and Science, Kasetsart University Kamphaeng Sean Campus, Kamphaeng Sean District, Nakornpathom province, Thailand. Her latest interest is biogeochemistry of greenhouse gases (GHGs), GHGs emissions from agricultural sector and forest, GHGs mitigation and adaptation.

UN CONTRAT SOCIAL POUR UNE AGRICULTURE DURABLE DANS L'ESPACE LOCAL? REPÈRES THÉORIQUES ET PRATIQUES D'UNE ÉCONOMIE PLUS SOLIDAIRE

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Sous le régime d'une modernisation accélérée, l'intensification des systèmes de production agricole a rompu des liens historiques et sociaux construits par les travailleurs agricoles et leurs familles avec un milieu de vie. L'avènement de la globalisation ayant mis à jour la vulnérabilité des systèmes agricoles et ses effets émergents, les modèles de

développement de l'agriculture sont aujourd'hui au cœur de débats publics, en France comme en Algérie. La promesse d'un développement durable, possible et acceptable, suscite à la fois des espoirs et des controverses entre acteurs locaux, experts et institutions, mobilisés par des approches normatives encadrant un développement durable comme une catégorie nouvelle d'intervention publique.

Cette communication se propose d'analyser l'impact des logiques de travail en agriculture et de l'organisation des échanges économiques et techniques sur les liens sociaux et structurels qui constituent les fondements des sociétés. Partant du constat des difficultés récurrentes à intégrer la dimension sociétale dans les projets conduits au nom du développement durable, cette communication a pour objectif d'interroger et de mettre en valeur les principes qui nourrissent les relations des communautés locales à leur environnement, local et global, afin de comprendre l'agriculture comme une pratique sociale au cœur d'un paradigme de l'échange social.

L'agriculture durable est affaire citoyenne, elle répond des formes de solidarité et construit ses principes par la prise en compte de l'expérience et du sens pratique des travailleurs ruraux. Composante d'un contrat social qui fait lien dans un espace local, le développement rural durable est appelé à relever le défi d'un projet d'agriculture pour le bien commun avec la participation des habitants, agriculteurs et non agriculteurs.

Mots clés: Outils Théoriques/ Échange Social/ Agriculture Durable/ Espace Local/ Solidaire.

Biographie :

Josiane STOESSEL-RITZ est Maître de conférences HDR à l'Université de Haute-Alsace (Mulhouse), Directrice du Master Ingénierie de projets en économie sociale et solidaire et Chercheur au Groupe de Sociologie politique européenne (UMR7012).

THE EFFECT OF FEEDING ENSILAGES OF POULTRY LITTER WITH BREAD LEFT OVER ON THE BODY WEIGHT OF BARKA CATTLE

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Litters from replacement birds, layers and broilers were collected; sun dried and analyzed for the content of crude protein (CP), crude fiber (CF), ash and fat. The litters were ensiled with bread left over in a ratio of 45.5: 54.5 by weight in plastic containers for a minimum of 21 days. The process of ensiling resulted in a product that had a higher CP content after ensiling. The ensilages were of wholesome appearance, palatable and safe. Sixteen Barka cattle were divided into groups of four cattle in each treatment and a 90 days trial was conducted. The treatments consisted of a control diet (T1) consisting of a commercial type ration made up of 30% wheat bran, 36.3% bread left over, 2.4% fish meal, 30.3% taff straw and 1% salt. The other three treatments consisted of ensilages of 30% replacement litter (T2); layer litter (T3) or broiler litter (T4) with bread left over 36.3%, fishmeal 2.4%, taff straw 30.3% and salt 1%. The feeding system was restricted and all the groups consumed all the feed that was offered to them (7.44 kg of DM per cattle per day). Average body weight gains (ABG) for T1, T2, T3 and T4 were 1.093, 1.019, 0.673 and 0.966 kg/day, respectively. ABG for T1, T2 and T4 were not significantly different ($P > 0.05$), whereas cattle fed on T3 were significantly different ($P < 0.05$) from ABG of T1, T2 and T4. Wheat bran can be completely replaced by replacement and broiler litters in rations for Barka cattle.

Keywords: Barka Cattle, Bread Left Over, Ensiling, Poultry Litter, Wheat Bran.

Biography:

Tekeste Abraham was born in 1974 in Addis Ababa, Ethiopia. He completed high school in 1992. He joined Teacher Training Institute and graduated in Diploma as a teacher in 1994. He has been thought in elementary school for two years. In 1996, he joined at Asmara University and graduated with B.Sc. in Animal Science in 2000. Up on graduation, he had stint with Elabered Estate as Dairy Unit Head. In 2004, he joined Asmara University to pursue his M.Sc.

study and successfully completed in Sustainable Livestock Production in 2006. Currently, he is working as Animal Production Expert in Ministry of Agriculture.

COMPARATIVE FEEDING VALUE OF HALOPHYTE AS ALTERNATIVE ANIMAL FEED FOR SMALL RUMINANTS IN ERITREA
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A totally of 160 sheep and goats were used for 84 feeding trial days to investigate the feeding value of halophyte as alternative animal feed. Three feed types i.e. halophyte (H), sorghum husk (SH) and Shishay (S) were used to formulate the ration of the four treatments: Tr.1 (100%H), Tr.2 (70%SH & 30%H), Tr.3 (70%SH & 30%S) and Tr.4 (100%SH). In case of sheep results of Tr.1, Tr.2, Tr.3 and Tr.4 were 27.1±0.8, 24.55±0.46, 24.2±0.52, 25.9±0.34 kg; 0.54±0.02, 0.74±0.02, 0.51±0.03, 0.79±0.03 kg/h/d and 4.8, 13.9, 7.5, 16.5 gDMI/1gADG for average body gain, dry matter intake (DMI) and feed conversion rate (FCR) respectively. The values in case of goats were 18.6±0.40, 18.3±0.29, 18.5±0.31, 18.4±0.34 kg; 0.59±0.03, 0.64±0.01, 0.56±0.02, 0.75±0.03 kg/h/d; 11.1, 24.0, 13.7, 16.7 gDMI/1gADG respectively. Sheep's body gain results showed a significant difference ($P < 0.05$) among all treatments except between Tr.2 and Tr.3. Among DMI of sheep no significant difference ($P > 0.05$) were found between Tr.1 & Tr.3, and between Tr.2 & Tr.4 and DMI of goats in Tr.4 was different from all treatments. The absence of significance on body weight gain between Tr.2 and Tr.3 for both species indicated that inclusion of 30% halophyte in the diet can substitute 30% shishay, which is expensive and not readily available, without affecting body weight gain response significantly. And thus, halophyte can be used as alternative animal feed for small ruminants to fill the gap of feed shortage and non availability in Eritrea. However, further study is necessary to see halophyte's impact on milk production, fertility, meat quality and the economical use of the feed.

Keywords: Feeding value; Halophyte; Body weight gain; Sheep; Goat

Biography:

Kal'ab Negash Tesfa was born of his father Negash Tesfa and mother Letenkiel Teferi on 18 September 1972 in Zibanzigib, Eritrea. He attended elementary and Secondary schools in Adikeih, obtained BSC degree in 1999 in Animal Sciences from University of Asmara, Eritrea, MSc degree in 2003 in Animal Sciences with area of specialization in Breeding and Genetics from University of the Free State, South Africa. From 2000 to 2006 he has been working in the Department of Animal sciences of University Asmara as graduate assistant and lecturer. He joined to Department of Animal Sciences of Hamelmalo Agricultural College in November 2006, since then he is working in the college as lecturer and researcher. He is married to Rahel Tekie in 2008.

REDUCTION OF WATER LOSSES BY USE OF ALTERNATIVE IRRIGATION TECHNIQUES IN THE ARAL SEA DRAINAGE BASIN

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The Aral Sea drainage basin (ASDB) in Central Asia is a region under severe water stress. Its population depends to large extent economically on irrigated agriculture, which consumes over 90% of the withdrawn freshwater in the drainage basin. There is thus a strong need to increase the water productivity, i.e., the ratio between the crop production and the water use. We analyse impacts on water use of possible large-scale implementations of alternative irrigation techniques, replacing traditional furrow irrigation on cotton fields in the ASDB. We base our quantifications on experimental field comparisons of yield and water loss between traditional furrow irrigation and alternative irrigation techniques (drip irrigation, alternate furrow irrigation, surge flow irrigation and surge flow irrigation on alternate furrows). All alternative methods, except for drip irrigation,

have lower cotton yields than the traditional furrow irrigation. We here show that in order to keep the cotton production unchanged when yields are lower, extended irrigation areas are needed, over which non-negligible additional water volumes will be lost. Despite such negative feedback effects, our results show that the irrigation water use on cotton fields in the ASDB could decrease by as much as 10 km³/year, if the traditional furrow irrigation were to be replaced by one (or several) of the here investigated alternative methods. Such water savings can considerably influence the hydrological conditions in the entire basin. In particular, the savings would reduce the severe water stress in the lower ASDB, which suffers from elevated groundwater tables and high soil and groundwater salinity.

Keywords: Aral Sea, Irrigation, Water productivity, Hydrology, Cotton

Biography:

Rebecka Törnqvist is PhD student in hydrology and water resources. Her work is focusing on basin-scale hydrological and pollutant load impacts of land use and climatic changes in the Aral Sea Drainage Basin (ASDB). She holds a M.Sc. in Aquatic and Environmental Engineering.

Jerker Jarsjö is associate professor in hydrogeology. He is principal investigator for several international research projects on water resources and spreading of waterborne contaminants, including a project on agricultural impacts in the ASDB, funded by the Swedish Internat. Development Cooperation Agency.

ÉTHANOL, CRISE ALIMENTAIRE ET SÉCURITÉ INTERNATIONALE : LE CAS DES ÉTATS-UNIS

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Au cours des deux dernières années, le monde a été secoué à la fois par une crise alimentaire dont les émeutes de la faim au printemps dernier ont été le point culminant. Cette crise

est intimement liée à la hausse des cours du pétrole qui rend plus attrayant la production de biocarburants. C'est dans cet esprit que les États-Unis, qui figurent avec le Brésil et l'UE comme un des grands joueurs de cette industrie, projettent de doubler les surfaces consacrées à la production de biocarburants au cours des prochaines années. La présente communication vise à examiner à partir de rapports du gouvernement américain et d'études spécialisées les effets de cette politique : importance des subsides, coût économique, réorientation de la production agricole, compétition pour les terres arabes, impacts environnementaux, influence sur la production de céréales, relation avec la présente crise alimentaire mondiale et conséquences sur la stabilité internationale.

Mots clés : États-Unis, Éthanol, Crise alimentaire, Crise énergétique, Sécurité internationale

Biographie:

Né au Québec en 1949, Gilles Vandal a obtenu un doctorat en histoire américaine au Collège William and Mary en Virginie en 1978, année de son embauche à l'Université de Sherbrooke. Bien que ses intérêts furent d'abord centrés sur le 19e siècle, il dispense depuis plus de vingt ans des enseignements sur la politique étrangère des États-Unis et le fonctionnement des institutions politiques américaines. Auteur de deux livres, il a aussi collaboré à deux autres ouvrages et publié plus d'une vingtaine d'articles dont plusieurs dans de grandes revues scientifiques internationales, dont quatre ont été reproduits dans des ouvrages collectifs par des spécialistes américains. Il a aussi prononcé plus de soixante communications et conférences sur différents aspects de l'histoire et de la politique américaine. Finalement, il a obtenu une bourse Fulbright en 1992.

SÉCURITÉ ALIMENTAIRE ET DÉVELOPPEMENT DURABLE EN ALGÉRIE

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La planification agricole s'avère un élément déterminant dans la recherche de la satisfaction des besoins alimentaires d'un pays, surtout si l'on respecte les principes communs à de nombreux pays: maîtrise de la croissance démographique; mobilisation maximale des ressources en eau; protection de l'environnement; conduite de l'élevage selon des techniques modernes; lutte contre l'érosion et la désertification etc.

Dans cet essai, nous essayons à travers des données, de la région Nord-est du pays, de faire une analyse des situations de pénuries récurrentes à partir des résultats actuels et de suggérer quelques voies d'amélioration conformes aux concepts internationaux de sécurité alimentaire et de développement durable.

Dans le cas de l'Algérie, le défi de l'autosuffisance alimentaire repose sur d'autres conditions à savoir: la lutte contre toutes les formes de gaspillage; -l'utilisation rationnelle des compétences managériales; la stabilité des politiques agricoles

Nous concluons aussi, que les échanges et la complémentarité régionale notamment entre les pays du Maghreb font partie des suggestions préconisées.

Mots-clés: Planification Agricole, Compétences Managériales; Suffisance Alimentaire, Gaspillage, Coopération.

VULNÉRABILITÉ ET ADAPTATION DU MILIEU NATUREL DE LA COMMUNE RURALE DE BOUDINAR AUX ÉVÈNEMENTS CLIMATIQUES EXTRÊMES

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Dans les environnements semi-arides et arides fragiles, la vulnérabilité au changement, qu'il soit d'origine climatique ou lié aux transformations dans l'utilisation des terres, est très grande, souvent accompagnée d'une augmentation de la menace de crise hydraulique, de la dégradation des ressources naturelles et de la désertification.

Le littoral méditerranéen oriental, et notamment le territoire communal de Boudinar est touché par les processus de dégradation des ressources naturelles (sol-eau-végétation) et les événements climatiques extrêmes (sécheresse, pluies exceptionnelles, inondations). La croissance du couvert végétal y est limitée par l'action conjointe des températures élevées et du déficit hydrique, ce qui engendre des écosystèmes vulnérables aux processus de dégradation des sols, de glissement de terrain et de désertification.

Une étude réalisée dans le cadre des activités du projet ACCMA « Adaptation aux Changements Climatiques au Maroc : www.accma-maroc.com » dans la commune rurale de Boudinar, a permis d'élaborer des cartes prédictives et descriptives du risque d'érosion et de dégradation potentielles et réelles. Les résultats obtenus montrent que le risque d'érosion est très intense et résulte de la conjugaison des facteurs biophysiques (pentes fortes, roche tendre très érodable, sol très peu perméable, couvert végétal dégradé) et des facteurs climatiques (agressivité de pluie accentuée par des événements pluviométriques extrêmes).

L'érosion hydrique dans la zone est très active. Elle y est représentée par toutes les formes, de l'érosion en nappe jusqu'aux ravinements hiérarchisés et « badlands ». Elle se manifeste essentiellement par des ravinements sur les sols lourds : à substrat tendre (les marnes et sols limono-argileux) et par décapage et appauvrissement des sols par le départ de la partie colloïdale (argile et humus) des horizons de surface qui deviennent ainsi très caillouteux et marginaux.

L'action anthropique a favorisé la dégradation du milieu naturel par des pratiques culturales irrationnelles. L'extension des superficies mises en culture sur des versants fortement en pente; le labour pratiqué selon le sens de la pente; l'assolement inadapté laissant de grandes surfaces nues et soumises aux fortes pluies d'automne et du début de l'hiver; et le surpâturage sont tant de pratiques nuisibles à l'intégrité des écosystèmes.

L'analyse conduite a permis de définir les zones prioritaires pour l'orientation de propositions

d'adaptation relatives à des interventions d'aménagement et de conservation des sols et d'adaptation aux effets néfastes des changements climatiques.

LA VULNÉRABILITÉ DES ÉCOSYSTÈMES DE L'EMBOUCHURE DE LA MOULOUYA AUX IMPACTS DES CHANGEMENTS CLIMATIQUES (ÉLÉVATION DU NIVEAU DE LA MER)

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Les richesses écologiques de la frange côtière « Saaidia – Ras Elma » au nord du Maroc sont localisées au niveau des zones à topographie relativement basse, notamment au niveau de la plaine alluviale de la Moulouya et des dépressions inter-dunaires. Ces écosystèmes et leur biodiversité sont donc menacés par l'érosion côtière, la submersion et la salinisation de l'estuaire et des eaux souterraines suite à une élévation prévisible du niveau de la mer. Ceci risque de conduire à un déséquilibre au niveau des habitats et par conséquent à la disparition de certains animaux qui leurs sont inféodés, si des actions soutenues de réduction de vulnérabilité et des mesures d'adaptation ne sont pas entreprises

Le présent travail, réalisé dans le cadre du projet ACCMA (www.accma-maroc.com) s'est fixé comme objectif d'analyser et de cartographier les groupements végétaux afin d'évaluer leurs degrés de vulnérabilité à l'élévation du niveau de la mer. L'inventaire de la végétation et du milieu a été réalisé sur la base d'un diagnostic phyto-sociologique effectué à l'aide de 52 relevés de végétation représentant des faciès écologiques homogènes au sein de la zone d'étude. La détermination de ces unités homogènes a été accomplie à l'aide de l'interprétation des photographies aériennes récentes, complétée et validée par l'observation sur le terrain.

L'analyse floristique par la méthode numérique (AFC), a permis d'identifier huit groupements végétaux qui se distinguent sur les plans floristique et hydrologique. La

diversité de ces groupements végétaux est expliquée par la présence d'une grande variété d'habitats qui est caractérisée par un continuum terre-eau contrasté par l'existence d'une mosaïque végétale, d'un bras mort et divers marais. Du point de vue faunistique, la zone d'étude se particularise par le grand nombre d'espèces rares, remarquables et endémiques.

En se basant sur les prévisions des scénarios des changements climatiques élaborés dans le cadre du projet ACCMA, il ressort que 16,63% à 31,23% de la surface totale des groupements végétaux actuels ont une vulnérabilité très élevée et seront affectés par l'élévation du niveau de mer, ce qui menacerait leur existence, leur stabilité et leurs fonctions écologiques.

Pour faire face à cette problématique environnementale des mesures d'adaptation doivent être envisagées afin de diminuer la vulnérabilité ou d'augmenter la résilience de ces écosystèmes qui ont été classés Site d'Intérêt Biologique et Ecologique au niveau national et Site Ramsar au niveau international.

Mots clés : changements climatiques, Saaidia-Ras El Ma, vulnérabilité, élévation du niveau de la mer, Groupements végétaux, adaptation.

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