

SUSTAINABLE USE OF WATER RESOURCES FOR FOOD SECURITY

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ABSTRACT

In 1798 Thomas Malthus argued in his famous *An Essay on the Principle of Population* "the increase of food would by no means keep pace with the much more rapid increase of population"; that is, according to Malthus, because "population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio". The so called *Green revolution* has allowed great increases in agricultural production in years after the war, providing enough food to meet the demands of a growing population and thus denying these pessimistic predictions.

Eating habits, though, have been changing during the years, due to the increased economic capability of the population, especially in Developing Countries. Consumption per capita have been growing (*OECD, 2010*) and, according to estimates provided by FAO (2010) the increase of world population will boost demand for food by 70% in the next decades. On the other hand, agricultural areas have been progressively reducing because of factors such as urbanization, desertification, erosion and salinization. Therefore, the increase in population coupled with the reduction of arable land, resulted in a reduction of surfaces for food per capita. All worldwide statistical evidence confirms sustainable water management as the key issue in order to satisfy the new incoming demands of agriculture. Nevertheless, this question is currently failing to achieve priority, compared with other competing sectors; moreover, pressure on water will continue to scale up, although at slower rates than in the past, but still in an increasing way. So, even though the world as a whole has been making progress towards improved food security and nutrition, factors threatening sustainability are still going to be very remarkable and, what is more noteworthy, they are likely to be coming more intensively from rural poverty communities, as more and more people attempt to extract a living out of dwindling resources.

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Therefore the real challenge for human kind in the near future is to produce more food, pollute less and thus preserve natural resources, in order to achieve what is today advised as *sustainable intensification* (OECD, 2011); there is considerable scope for improvements in this direction. Taking into account the equation quantifying the impact of changes in water use efficiency as occurring through component steps on the overall efficiency, it is generally established that it is much more effective to achieve small improvements in several or more steps rather than concentrating efforts to improve one or two steps. An overview of the new strategies capable of improving WUE at the field level will be presented.

KEY WORDS: sustainable water management, crop intensification, food security.

RÉSUMÉ

En 1798 Thomas Malthus a fait valoir dans son célèbre *Essai sur le principe de population*, «Augmentation de la nourriture serait en aucun cas capable de concourir avec l'augmentation beaucoup plus rapide de la population», parce que "la population, si elle est décochée, les hausses dans un rapport géométrique. Augmente de subsistance dans un rapport arithmétique ". Le soi-disant Révolution verte a permis de grandes augmentations de la production agricole dans les années après la guerre, en fournissant suffisamment de nourriture pour répondre aux besoins d'une population croissante et de nier ainsi ces prédictions pessimistes. Les habitudes alimentaires, cependant, changement ont été de au cours des années, à cause de l'augmentation de la capacité économique de la population, en particulier dans les pays en développement. Par conséquent, l'augmentation de la population couplée avec la réduction des terres arables, a entraîné une réduction des surfaces pour l'alimentation par habitant. Toutes les données statistiques à travers le monde confirme la gestion durable de l'eau que la question clé afin de satisfaire les exigences de la nouvelle agriculture. Donc entrant le véritable défi pour le genre humain dans un proche avenir est de produire plus de nourriture, moins polluer et ainsi préserver les ressources naturelles. Un aperçu des nouvelles stratégies capables d'améliorer l'efficacité dans l'utilisation de l'eau au niveau de l'agriculture sera présenté.