LARC/04/INF/6

E

December 2003

منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Organización de las Naciones Unidas para la Agricultura y la Alimentación

TWENTY-EIGHTH REGIONAL CONFERENCE FOR LATIN AMERICA AND THE CARIBBEAN

Guatemala City, Guatemala, 26 to 30 April 2004

THE INTERNATIONAL YEAR OF RICE (2004)

I. Introduction

1. On 16 December 2002 the United Nations General Assembly (UNGA) declared 2004 the International Year of Rice to focus the world's attention on the role that rice can play in providing food security and poverty alleviation. *Rice is life* for major populations of the world and is deeply embedded in the cultural heritage of many societies. It is the staple food for more than half of the world's population. Rice-based production systems and their associated post-harvest operations employ nearly a billion people in rural areas in developing countries. About four-fifths of the world's rice is grown by small-scale farmers in low-income and developing countries.

2. The implementation of the International Year of Rice is an opportunity to raise support for the sustainable development of rice-based production systems for food security and poverty alleviation. Rice is the most rapidly growing food source in Latin America and the Caribbean. Current rice demand exceeds the region's production capacity and regional rice imports are costly. This paper discusses the regional importance of rice in Latin America and the Caribbean and the potentials and constraints for a sustainable increase in production. It also discusses the background of the International Year of Rice, the different facets of rice-based production systems, the Year's challenges and opportunities and its implementation framework.

II. Potentials and Constraints for Sustainable Rice Production in Latin America and the Caribbean

3. Rice is grown in 26 countries in the Latin American and Caribbean region (LAC). These countries annually produce more than 22 million tons (paddy). Although significant improvements have been achieved in rice production in the region, demand continues to surpass production. The region has a net deficit of nearly 1 million tons of milled rice annually, resulting in a net outflow of revenue of over $300 million annually and in an implied consumption of approximately 30 kg/capita for the 511 million inhabitants of the region. There are 14 countries/states in the Caribbean that have little potential for domestic rice production and will continue to be rice importers, though there are another 14 countries which have a current deficit in

For reasons of economy, this document is produced in a limited number of copies. Delegates and observers are kindly requested to bring it to the meetings and to refrain from asking for additional copies, unless strictly indispensable.
Most FAO meeting documents are available on Internet at www.fao.org

rice but have the natural resources available to support more rice production. These countries are of primary concern because, with the appropriate development strategy and assistance from the international donor community, they have the potential to increase production to satisfy national demand.

Trends and Advances in Rice Production

4. During the last two decades, the most important trend in rice production in Latin America has been the rapid decline in planted area with a steady increase in overall production. Since 1980, rice area has decreased 25%, which in absolute terms represents a loss of nearly 2 million hectares. During the same period, total production has increased from 14.4 to 22.8 million tons, representing a 58% increase in production. Yield advancement is the primary factor that has permitted this progress. Yield in Central America and the Caribbean has increased by 19% over the last two decades, which reflects the transition from less favoured low-yielding upland production methods to more productive and stable rainfed and irrigated systems. In Brazil, the area committed to low-yielding upland rice has decreased in the central region. At the same time, yield improvement in irrigated rice in the southern region and other areas contributed significantly to the rapid improvement in average yield in Latin America.

5. Production under irrigation and the more highly favoured upland systems currently account for approximately 70% of all rice production in the LAC and high-yielding genotypes currently occupy more than 90% of the area. However, farmers' yields remain far below the potential of available varieties. The difference between readily obtainable yield and average farm yield is referred to as the "yield gap." The yield gap is apparent in all irrigated rice production areas. Bridging the yield gap represents the most immediate opportunity for increasing rice production in the LAC.

Constraints of Sustainable Rice Production and Causes of the Yield Gap

6. The yield gap in irrigated rice results from numerous deficiencies, principally inadequate crop management which precludes the realization of the yield potential of high-yielding genotypes. The yield gap is most striking in countries that plant new, high-yielding varieties with disease and insect resistance, tolerance to lodging and exceptional plant types. Improved crop management technology that permits high-yielding varieties to realize more of their yield potential is available but has not been introduced, tested or modified to suit local conditions. These technologies include land preparation techniques, use of high quality seeds, more appropriate planting systems, efficient and timely fertilizer applications, effective and efficient weed control practices, integrated pest management, rational water management and timely harvesting. Limited use of available technologies restricts yields and results in production losses.

7. Deficiencies in crop management are a result of inadequate technology transfer, mainly due to the rapid changes occurring in the agricultural sector throughout the LAC region. The decline in research and technology transfer activities supported by the public sector has severely restricted field activities, especially in the area of crop management. In addition to the decline of public-sector support at the national level, international assistance in rice research and technology transfer in the LAC has declined significantly. The Centro Internacional de Agricultura Tropical (CIAT) had been the major source of elite germplasm, technical assistance and training in irrigated rice for most LAC countries. In 1990, CIAT severely reduced its irrigated rice research programme. Similarly, the International Rice Research Institute (IRRI) discontinued introducing genetic material into LAC national programmes via its international variety-testing programme.

Variety Improvement

8. Rice production in the LAC witnessed its first quantum leap in yield during the 1970s and 1980s due to the identification and rapid adoption of improved, high-yielding genotypes. New varieties rapidly spread throughout the irrigated and favoured upland ecologies, resulting in annual yield growth rates of 3.3% during the decade of the 1980s. During the 1990s further

improvements were made, though mostly due to the incorporation of more disease and insect resistance and grain quality characteristics. Most of the genetic improvement accomplished during the 1970s and 1980s originated from the CIAT rice-breeding programme. Approximately 40% of all improved irrigated rice varieties released in the LAC originate directly from CIAT germplasm. Also, a large percentage of the material released from national programmes was derived from crosses utilizing progenitors from the CIAT programme. Countries with weak national rice research organizations and without strong grower associations were unable to continually provide improved genetic material to growers in the absence of germplasm from CIAT. Consequently, much of the genetic material currently used in many countries is over 15 years old and lacks many improved genetic traits.

9. An extremely important trait is improved tolerance to delayed harvesting that permits growers to harvest rice at a lower moisture content and still obtain high head rice yields. Some countries realized the deficits of available genetic material and pooled resources to create FLAR (Latin American Fund for Irrigated Rice) to largely replace the former CIAT irrigated rice-breeding programme. During the last seven years, FLAR has made major strides in variety improvements and has made available large amounts of improved material with enhanced disease resistance, high grain quality and other favourable traits which offer higher yield potential.

10. Variety needs can largely be segmented into tropical and temperate zones. The priority constraints for the tropical zone are blast, hoja blanca virus, plant hopper (*Tagosodes oryzicolus*) and grain quality. In addition, high yield potential is being recognized as an increasingly important trait. Many new genetic materials which possess the above traits are currently being tested in several tropical countries in the LAC. In the temperate regions which include southern Brazil, Uruguay, parts of Argentina and Chile, variety problems are more diverse. Southern Brazil and Uruguay and Chile have severe cold stress that adversely affects yields during various phases of crop development. Identification of cold tolerance during germination will permit growers to plant earlier, which exposes the crop to more favourable climatic conditions during the reproductive phase, resulting in higher yield potential. Another avenue being pursued is cold tolerance during the reproductive stage, which will reduce yield losses from late plantings. Blast can be a devastating disease and caution should be exercised in promoting highly susceptible genetic material in any environment in the LAC. Argentina has a localized problem with straight head disorder but new germplasm with high tolerance has been recently identified. Chile has special problems with irrigation management that greatly restrict realization of high yielding varieties. Varieties currently grown in Chile have high tolerance to cold but poor grain quality and limited yield potential. Chile could benefit tremendously from the cooperative cold tolerance programme developed by IRGA, INIA and FLAR

11. A sustainable increase in rice production in Latin America and the Caribbean requires strategies for overcoming the constraints that limit the growth of the rice industry. The implementation of the Year as declared by the United Nations General Assembly would increase awareness on the importance of rice for food security and reduce poverty in Latin America and the Caribbean. It would also raise support and commitment to sustainable rice production worldwide.

III. The International Year of Rice: Background and History

12. The initiative for establishing an IYR commenced in 1999 when the International Rice Research Institute, reflecting the growing concerns of its members over an increasing number of serious issues facing rice development, requested and obtained FAO collaboration in having an International Year declared. This was pursued by FAO member countries leading to the Resolution 2/2001, adopted at the 31st session of the FAO Conference, requesting the UNGA to declare 2004 as the IYR. The request, submitted to the UNGA by the Delegation of the Philippines and co-sponsored by an additional 43 countries, was considered at the Fifty-seventh session, which declared 2004 the International Year of Rice (Box). FAO was invited to facilitate the implementation of the IYR in collaboration with other relevant organizations.

13. The importance that member states are giving to sustainable rice development is reflected in a growing number of global initiatives. These include those taken at the 1992 Rio Summit and elaborated in Agenda 21's chapter on Sustainable Agriculture and Rural Development (SARD), at the recent World Conference on Sustainable Development, in the Declaration on World Food Security and the World Food Summit Plan of Action in 1996 and in the United Nations Millennium Declaration in 2000.

The General Assembly,

Recalling resolution 2/2001 of the Conference of the Food and Agriculture Organization of the United Nations,

Noting that rice is the staple food of more than half of the world's population,

Affirming the need to heighten awareness for the role of rice in alleviating poverty and malnutrition,

Reaffirming the need to focus world attention on the role that rice can play in providing food security and eradicating poverty in the attainment of the internationally agreed development goals, including those contained in the United Nations Millennium Declaration,

1. *Decides* to declare the year 2004 the International Year of Rice;
2. *Invites* the Food and Agriculture Organization of the United Nations to facilitate the implementation of the International Year of Rice, in collaboration with Governments, the United Nations Development Programme, the Consultative Group on International Agricultural Research Centres and other relevant organizations of the United Nations system and non-governmental organizations.

(Source: United Nations General Assembly; A/Res/57/162; dated 16 December 2002)

IV. Rice Is Life: Aspects of Rice-Based Systems

14. The UNGA Declaration of the IYR not only emphasizes the importance of rice, but also points to the importance of agriculture systems as a whole when addressing issues of global concern. Agriculture systems affect and are affected by nearly every aspect of sustainable development. The IYR envisions rice as the focal point of a prism through which the intricate and interdependent relationships between agriculture, culture, nutrition, environmental resource management, biodiversity, economic policies, science, gender and labour issues can be viewed clearly.

Rice and Culture

15. Thousands of years ago, people from East to South Asia settled throughout river deltas and domesticated wild rice. The productivity of wetland rice crops enabled population growth and led to the development of society and civilization. Both in ancient and present times, the intense labour needed to reclaim land for rice cultivation, to build and maintain the terrace system, or to synchronize the cropping pattern against soil erosion, landslide and flooding has required villages to work collaboratively. The relationship between rice and people has inspired songs, paintings, stories and other modes of communication. Rice (*Oryza sativa* L.), is now cultivated in 113 countries and on all the continents except Antarctica. It is significant that almost every culture has its own way of eating rice and that these different recipes are, in fact, part of the world's cultural heritage. Rice terraces beautify the landscapes and UNESCO declared the terraces in Banawe,

Philippines, a world cultural heritage site. Efforts are also underway to establish the conservation of other rice-based production systems as World Cultural Heritage sites.

Rice and Nutrition

16. More than two billion people still suffer from micronutrient malnutrition. Although rice provides a substantial amount of dietary energy, it has an incomplete amino acid profile and contains limited amounts of essential micronutrients. Malnutrition reduces children's ability to learn, decreases adult productivity and leads to premature death, particularly among women and children. Rice is the staple food for 17 countries in Asia and the Pacific, eight countries in Africa, seven countries in Latin America and the Caribbean, and one in the Near East. When all developing countries are considered together, rice provides 27% of dietary energy supply and 20% of dietary protein intake. Rice is a crop rich in genetic diversity and the two rice species, *Oryza sativa* L. (originally from Asia) and *O. glaberrima* Steud. (originally from West Africa) have spawned thousands of different varieties with different nutritional properties. If better utilized, varieties with higher nutritional value could contribute to reducing the global burden of malnutrition.

17. Most commonly, rice is milled, yielding white rice. While this process reduces cooking time and increases storage life, it also removes a large percentage of many nutrients including protein, fibre, fat, iron and B vitamins. People in a number of countries parboil rice grains to preserve the nutrients naturally present in rice. Fortification techniques can be used to add essential vitamins and minerals to the grain.

Rice and Agro-biodiversity

18. Rice-based systems support enormous reserves of agro-biodiversity, which serve to safeguard the environment, enhance rural people's livelihoods, and enrich people's diets. Local people often introduce cultivated plants, domesticated animals and aquaculture into the rice-based systems. Fish, frogs, snails, insects, and other aquatic organisms derived from these ecosystems help diversify and complete the rural diet. Fisheries are particularly important for poor people, especially the landless, who may earn modest incomes from marketing fresh or processed aquatic food and medicinal products.

19. Various kinds of livestock are supported by rice-based systems. Ducks feed on small fish, other aquatic organisms and weeds within the paddy fields, while buffaloes, cattle, sheep and goats graze on rice straw as their main food source in rice-producing areas. Rice bran, a by-product of rice milling, and low quality and surplus rice grains provide feed supplementation for livestock. In turn, livestock help farmers with transportation needs and land preparation; and, in turn, livestock waste can be recycled into organic fertilizer.

20. Rice fields also host a wide variety of natural enemies or predators, which provide a mechanism to control harmful insects and pests, thus reducing the need for pesticides. Similarly, fish feed on weeds and assist in weed control. Plant varieties are used by farmers for food and medicine and as feed for fish and livestock. The agro-biodiversity within the rice-based systems presents great opportunities for improved rural nutrition, increased farmer income through crop diversification, and the protection of a wealth of genetic resources for future generations.

Rice and the Environment

21. Water management is a key feature to creating sustainable rice-based production systems, particularly because rice is the only major cereal that can withstand water submergence. The relationship between rice and water is complex. For example, submerged rice systems enable organic matter to accumulate in soils, creating a nutrient reservoir for plants and animals. These systems also act as a "sponge" or reservoir that captures carbon from the atmosphere. However, the continuous flooding of rice fields without an adequate drying period has negative

environmental effects such as a slowed rate of soil decomposition, salinity build up and water logging. In addition, the standing water in rice-based systems provides a breeding ground for mosquitoes, which carry diseases such as malaria. At the same time, this very same water presence supports natural predators for mosquitoes and a wealth of biodiversity that helps to enhance farmers' livelihoods.

22. While upland systems use less freshwater resources than submerged rice systems, they also support less agro-biodiversity. It follows those actions to convert submerged rice paddies into systems that require less water need to realistically account for the multiple benefits and uses associated with rice-based water use.

Rice, Employment and Income

23. Rice is often the main source of employment, income and nutrition in many poor, food insecure regions of the world. Rice cultivation is the principal activity and source of income for about 100 million households in Asia and Africa. Post-harvest activities employ a large share of the total labour force in Southeast Asia. Several countries are also highly dependent on rice as a source of foreign exchange earnings and government revenue.

24. In the past two decades, international rice prices have followed a marked declining trend, both historically and in relation to other cereals. This tendency has been fostered by technical improvements, which have resulted in a lower production cost per unit and sizeable gains in global production through the late 1990s. For many small farmers, the plunge in rice prices has seriously undermined their household food security, encouraging migration from rural to urban areas. Rice farmers are also exposed to high degrees of risk due to the vagaries of weather. Given the direct relationship between the rice market and rural livelihoods, many governments intervene and play an active role in domestic rice price stabilization.

Rice and Post-Harvest Production Activities

25. Post-harvest rice activities support the livelihoods of more people than just those who are involved in rice cultivation itself. The term, "post-harvest activities" refers to the suite of processes "from the floor to the fork," including threshing, milling, processing, market transport and cooking. Although much progress has been made in the prevention of post-harvest losses in rice, in developing countries rice losses average between 15 and 16 percent. These rice losses are significant during critical operations such as drying, storage and milling.

26. *Rice is Life* not only because of the food provided by its grains, but also because of the contribution of various parts of the rice plant to human life. For example, rice straw has been used as roofing material. The production, servicing and maintenance of tools, implements and equipment for harvest and post-harvest operations have created additional sources of employment for rural populations, while the trading of rice tools has supported the development of many manufacturing industries.

Gender in Rice Farming Systems

27. Women and smallholder farmers play an important role in both rice production and post-harvest activities, yet they often do not receive proportionate social and economic benefits when improvements in rice cultivation are initiated at the field level. Women often encounter more limitations than men regarding access to critical productive resources and services or when trying to access credit, farm inputs, marketing facilities, extension services and information. Furthermore, members of smallholder farming households, in particular women, children, the elderly, and people afflicted by illness such as HIV/AIDS, may have different information needs than those provided by current extension services.

28. National laws may give men and women equal rights to land but in practice this is not always the case. Real strides in poverty alleviation and improved livelihoods cannot be achieved

if the female portion of the population is left behind. There is an urgent need for equitable land and resource policies at the national level, with corresponding enforcement, to ensure that women too can benefit from improvements in rice-based systems.

Rice and Science

29. Science can help solve the riddle posed by a growing rice-consuming population that has access to diminishing land and water resources. During past decades increasing demand for rice has been met mainly through yield-enhancing measures of the "Green Revolution" in the 1970s, which introduced improved rice varieties and improved production technologies. In recent years, however, the return on these technologies has levelled off and experts have identified negative side effects such as increased resistance to pests over time and decreased biodiversity.

30. Research is now focused on creating improved technologies that enable farmers to grow more rice on limited land with less water, labour and pesticides, thus reducing damage to the environment. New rice varieties are also under development that exhibit enhanced nutritional value, minimize post harvest losses and have increased resistance to drought and pests. Recent advances in hybrid rice and the new rice for Africa (NERICA) are just two examples of the contributions of science to rice development. Partnerships between CGIAR centres, National Agricultural Research Systems and the private sector, especially in the area of modern biotechnology, should be strengthened to improve rice quality, productivity and efficiency in rice production.

Economic Policy Issues

31. With few exceptions, major rice producing countries are also large rice consuming countries. Governments are often confronted with the dilemma of keeping prices low for poor consumers, while keeping them attractive to producers. Traditionally, the need to resolve these conflicting interests has led to a large degree of government intervention in the sector, making rice one of the most heavily protected and subsidized agricultural commodities. This high level of protection has contributed to the low levels of international trade in rice, which currently accounts for only 4-6 percent of global production.

32. This situation began to change in the 1980s, with the implementation of structural adjustment programmes and, in 1994, with the WTO Agreement on Agriculture, which provided the basis for reduced government intervention and trade liberalization. Consequently, world trade in rice is expanding strongly, with a growing number of countries relying on imports to meet their domestic needs, especially in Africa. While the benefits of opening to trade have accrued mainly for urban consumers by enabling them to buy rice at lower prices, the brunt has been borne by the small, poor farmers in the developing countries. Developing countries are now confronted with the challenge of keeping abreast of the trade liberalization momentum, while also providing some alleviation to the plight of small producers.

V. The IYR: Challenges and Opportunities

33. The IYR aims to confront the many issues associated with rice-based systems in a global, coordinated framework in order to positively harness the potential of properly managed rice-based systems. The following discussion examines the facets of the rice prism to identify the size of the challenges and the opportunities for synthetic solutions that benefit rice-based systems as a whole.

Improving Nutrition and Food Security

34. The IYR can help increase dietary diversification through the promotion of complementary crops and livestock or fisheries activities within the rice-based system. This will enhance household food security both through improving producer income as well as adding

essential fatty acids, vitamins and minerals to the diet. Another strategy for improved nutrition is to improve processing techniques and the nutrient content of the varieties produced. As new food technologies come to the fore, consumers and producers must be better informed of the potential benefits, risks and limitations of new technologies such as biotechnology. The IYR can help nations develop the infrastructure to support and regulate these advances.

Managing Water Resources in Rice Ecologies

35. There is growing concern over the sustainability of global fresh water resources. At present, there are two prevalent approaches for rationalizing water scarcity within rice-based systems. The first approach aims at reducing the amount of water required for cultivation. It includes the development of rice varieties that are better suited for dry soils (such as aerobic rice varieties), introducing intermittent and improved irrigation systems and strengthening management practices. The second approach focuses on justifying water use by employing each drop of water for multiple uses - an example being the concurrent use of water both for irrigation and aquaculture. It emphasizes that the water management techniques must be introduced consistently with the systems so that water savings at the field level do not deprive other existing uses. The IYR can help raise awareness among the many beneficiaries of water in rice fields such as the diversity of life forms that are sustained within the rice-based systems while also promoting the development of rice cultivation in low water regimes.

Environmental Protection

36. There are a growing number of environmental concerns in rice production. The indiscriminate use of pesticides and inefficient use of fertilizers need to be confronted, as do the emissions of greenhouse gases. Environmental resource protection is of increasing public concern, and has been reflected in a growing number of international agreements such as the Convention on Biological Diversity and the Framework Convention on Climate Change. The attention now being given to protecting the environment has to be channelled into action complying with these agreements using an ecosystem approach that considers all the various issues related to rice development and the complexity of rice-based agro-eco-systems. The IYR will help to exchange concrete ideas on these environmental issues and related challenges and opportunities among the various stakeholders.

Enhancing Productivity: New Technologies with the Efficient Use of Resources

Closing the Yield Gap: Improving Crop Management Techniques

37. Most existing rice varieties, and particularly the high yielding varieties (HYV) and hybrids, have a potential yield that exceeds actual yield. Furthermore, there is considerable variation in the actual yield levels achieved even under similar production systems. The gap reflects numerous deficiencies due primarily to inadequate crop, nutrient and water management practices. Improved crop management technologies are available but many have not been widely introduced, tested or modified to suit local conditions. Methods for improving technology transfer include innovative means for sharing and exchanging knowledge and technology among research institutions and providing services to growers without large public sector support; successful examples such as the Farmer Field School exist and can be more widely promoted.

38. Soil-nutrient management is also an important aspect of improving crop management techniques for enhanced productivity, through the adoption of nutrient-efficient rice varieties, improved nitrogen placement methods and the use of appropriate diagnostic tools. Integrated management of pest, weeds and diseases in rice production with the use of a combination of resistant varieties, natural enemies, good agronomic practices and the timely application of appropriate pesticide with the appropriate dosage has proven to be more economically and environmentally sound. Integrated Pest Management promotes the development of agricultural biodiversity in rice fields. It follows that limitations in crop management are interlinked and

require a fully integrated system approach, also known as Rice Integrated Crop Management (RICM), which holistically combines variety, soil and water, nutrients, pests and other crop management practices for optimum economic efficiency and environmental sustainability. The IYR can help promote information exchange and the use of the RICM approach for "good agriculture practices," a term that encompasses the concept of using inputs more efficiently for increased productivity and economic return. It ensures that environmental and social aspects are taken into consideration at each decision point in the production chain.

The Systems Approach to Post Harvest Operations

39. The post-production system for rice has become a stimulus for growth with the introduction of high yielding varieties of rice and improved crop management. Small-scale rice producers dominate production systems in the low-income countries, and require considerable help to enable them to keep abreast of changing technological and economic innovation if they are to remain competitive. The IYR can increase awareness as to the importance of improving information mechanisms from the national level to the local level through "training and extension" services. In particular, the IYR can emphasize the importance of "adding value" to rice products, a term that refers to processing activities that strategically use all parts of the harvest for economic return.

Harnessing Science: Development, Safety Assessment, and Technology Transfer

40. High-yielding rice varieties, hybrid rice and the recently developed NERICA rice are available to achieve higher or more stable productivity in different ecological zones. There continues to be a number of challenges confronting the scientific community working on varietal improvements, which must be considered in a longer-term perspective. Still, opportunities exist for facing the challenges. Raising the yield ceiling can be achieved by a redesigned rice plant with improved yield potential and the development of hybrid rice for the tropics. International research institutions collaborating with national institutions can bring a broader approach to confronting genetic uniformity and erosion which leads to an end product that is highly vulnerable to major biological attack, as well as encouraging adoption of varieties having more nutritional quality, and the integration of varieties requiring less water and fertilizer in rice-based production systems.

41. The successful mapping of the rice genome in 2002 has further increased the potential for science. Through genetic alteration, the yield potential of rice could increase, while disease, weed and pest resistance and tolerance to drought and salinity could be achieved without harming the environment. However, these opportunities create new imperatives for biosafety, field testing, and capacity building within nations to ensure that the new innovations benefit local people and do not incur long-term costs on the environment. The IYR presents an opportunity for developing countries to acquire assistance to increase capacity building and establish biosafety regulations, as recommended during the Twentieth Session of the International Rice Commission, held in Bangkok, 2002.

Rice in the Institutional Context

42. In the wake of reduced capacity in national agricultural research and extension, non-governmental development partners, including civil society organizations and the private sector have, in some cases, begun to work with governments on sustainable agriculture and rural development. Good examples of such partnerships can be found within the context of smallholder rice, such as expansion of NGO-facilitated farmer field schools on Integrated Production and Protection Management programmes throughout Asia, and more recently, in Africa. More partnerships are required, however, to increase farmer access, particularly among women, to land, credit for investments in resources and information access to new technologies and innovations. Expanding and widening partnerships, including the private sector, will be a central challenge in many countries. Intergovernmental regulatory instruments affecting agriculture are becoming more prominent and of key importance for major crops like rice. For example, the negotiations

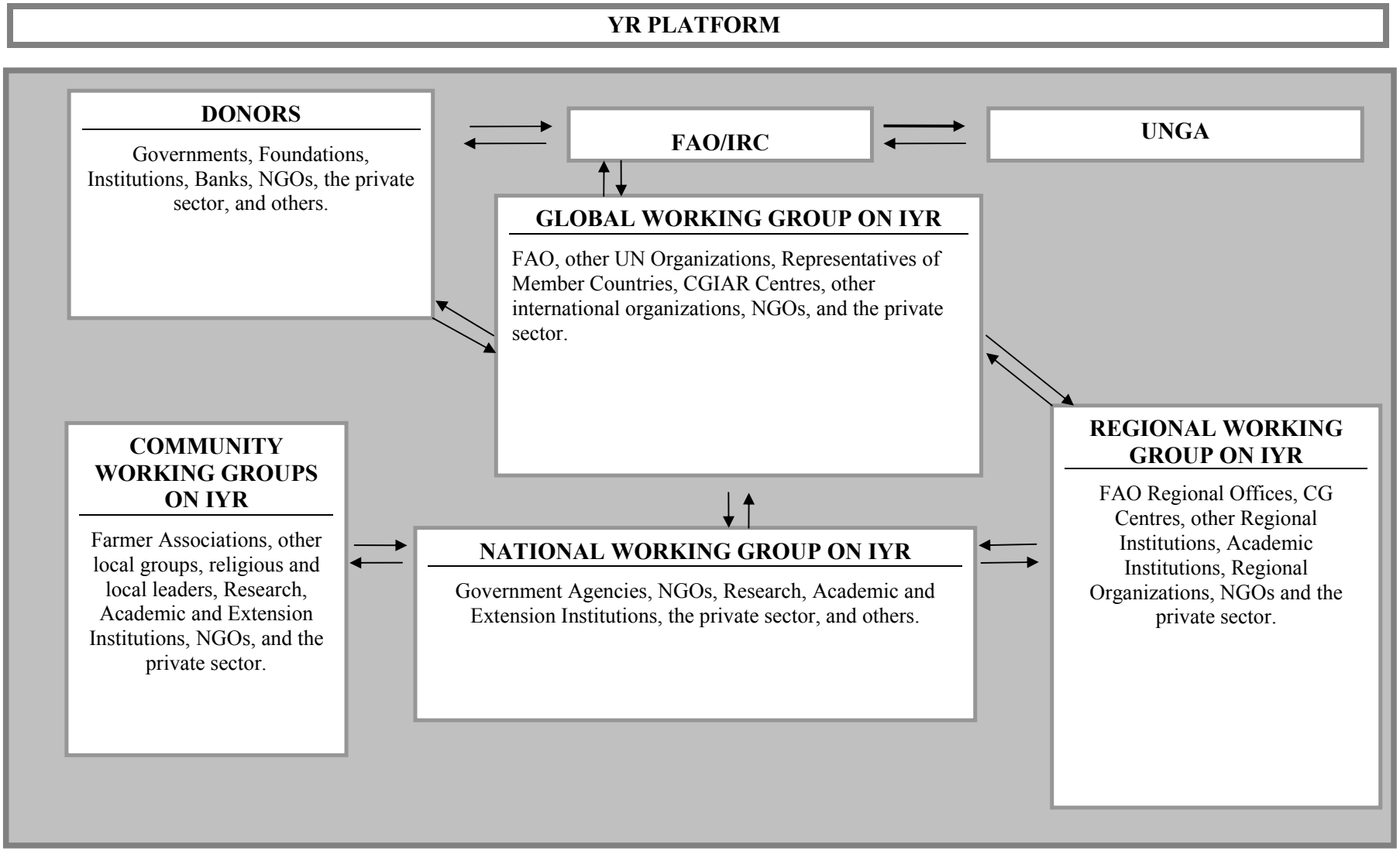
related to: food quality (CODEX); climate change; to trade including non-tariff trade barriers; to biological diversity and related issues of safe movement of modified living organisms; to the recent treaty on plant genetic resources to assure equal access and benefit sharing all affect crops like rice.

VI. A Conceptual Framework for IYR Implementation

43. The fundamental objective of IYR implementation is to promote and help guide the efficient and sustainable development of rice and rice-based production systems now and in the future. In order to meet this overarching goal, the IYR strategy will focus on the following intermediary objectives:

- Increase public awareness, at all levels, on the contributions of rice-based systems for food security, better nutrition, poverty alleviation, and livelihood improvement.
- Increase public awareness on the diversity and the complexity of rice-based production systems, as well as the challenges and opportunities for sustainable development of rice-based production systems.
- Promote, and provide technical support to ensure sustainable development of rice and rice-based systems at the global, regional, national and community levels.
- Promote the conservation and enhancement of rice-based products for economic, social, cultural and human health aspects of the population.

44. In achieving its objectives, the IYR is committed to a participatory, consultative, innovative and proactive approach, which acknowledges the ability and capacity of all stakeholders at all levels. In order to synchronize IYR efforts at the global, regional, national and local level, the Year will be implemented within an **IYR framework.** As the nominated lead organization for the IYR, FAO has established an IYR Coordination and Implementation Unit to help coordinate activities within the IYR framework at all levels. At the global level, coordination of the IYR activities will be the responsibility of an Informal International Working Group, which was established at the Informal International Planning and Coordination Meeting for the IYR. Daily management will be undertaken by the Secretariat of the International Rice Commission, hosted by the Crop and Grassland Service at FAO. The framework for the implementation of IYR at different levels from global to community is shown in Figure 1.


YR PLATFORM
DONORS
Governments, Foundations, Institutions, Banks, NGOs, the private sector, and others.
FAO/IRC
UNGA
GLOBAL WORKING GROUP ON IYR
FAO, other UN Organizations, Representatives of Member Countries, CGIAR Centres, other international organizations, NGOs, and the private sector.
COMMUNITY WORKING GROUPS ON IYR
Farmer Associations, other local groups, religious and local leaders, Research, Academic and Extension Institutions, NGOs, and the private sector.
NATIONAL WORKING GROUP ON IYR
Government Agencies, NGOs, Research, Academic and Extension Institutions, the private sector, and others.
REGIONAL WORKING GROUP ON IYR
FAO Regional Offices, CG Centres, other Regional Institutions, Academic Institutions, Regional Organizations, NGOs and the private sector.

The Strategy for IYR Implementation

45. The basis of the IYR implementation strategy is to engage the entire community in initiating combined and mutually beneficial actions for facing the challenges associated with a sustainable increase in rice production. This is to be achieved through the following **activities:**

- Collection and analyses on the relationship between rice-based systems and the global concerns as described in the "Rice is Life" section of this paper.
- Establish and conduct a sound multi-media communication strategy to disseminate information on rice-based systems which will assist member countries and regional institutions in the formulation of medium and long-term strategies for sustainable rice development. FAO, in close collaboration with other partners, will produce information packages and identify existing documentation for IYR use. FAO will also prepare country guidelines for National Working Groups on the IYR and ensure that the IYR international website is frequently updated with news from all levels on IYR observance.
- Organize and support global, regional and national workshops on rice-based systems. Key areas for consideration have been identified by the participants of the Informal International Planning and Coordination Meeting for the implementation of the IYR, held 6-7 March 2003, Rome, Italy.
- Conduct case studies to generate additional information and knowledge on particular aspects of rice-based systems.
- Organize and support global, regional, and national contests and exhibitions on rice and related issues.
- Provide technical support to member countries and farming communities in the formulation of strategy, programme and projects to support the sustainable development of rice and rice-based production systems.

46. Given that the IYR is a global awareness and action campaign, **reporting activities** are necessary to increase awareness on successful IYR initiatives, and they shall accompany all of the actions which are listed above. A final report on the activities and achievements of the IYR will be prepared by FAO in collaboration with the Informal International Working Group, for submission to the Secretary General of the UN and to all stakeholders.

47. In order to make IYR activities a success, **adequate funding** is essential. FAO will contribute considerable human resources from Headquarters and its decentralized regional, sub-regional and country offices. However, voluntary contributions from a wide range of sources will be necessary to implement the activities envisaged for the IYR. To meet these requirements, FAO proposes to establish a Trust Fund for the IYR covering the period from 2003 to 2005. The IYR strategy will make efficient use of its resources by using IYR funds to help establish and inform National Organizing Committees for the IYR; these committees can continue to develop the vision of the IYR beyond 2004.

Expected Outputs of the IYR Implementation

48. The IYR 2004 is not simply a one-year effort, to be forgotten in 2005. Therefore, the IYR strategy will be to employ the Year as a catalyst for information exchange and the initiation of medium and long-term programmes for sustainable rice development. For this reason, the establishment of IYR Committees at the National and Regional level is an essential aspect of the Year and FAO places particular emphasis on supporting the formulation of national programmes and development strategies for the medium and long-term.

Global outputs:

i. Published information on existing and planned international activities leading to scientific and economic contributions to efficient and sustainable rice development approaches and practices.

ii. Examples of the transfer of successful economic and technology methods at national and local levels.
iii. Dialogue and demonstration at the international level that contributes to heightened awareness of the importance and linkages of international inputs to the development efforts.
iv. Strengthened communication networks between global partners and those at other levels.
v. Agreed approaches for strengthening the linkage between research and development projects and activities at the global level with those at regional, national and local levels.
vi. Global recognition and improved understanding of outstanding rice-based agricultural heritage systems.

Regional outputs:

i. Contributions to regional conferences, consultations and meetings that improve awareness of challenges and opportunities relating to sustainable development of rice and rice-based production systems.
ii. Enhanced communication and networking systems for linking IYR partners both within and outside the region, and at all other levels.
iii. Examples of regional initiatives and activities that have contributed to sustainable development of rice-based production systems.

National outputs:

i. Published guidelines and approaches for national policies for sustainable development of rice and rice-based production systems and examples of their successful implementation.
ii. Educational and training material on IYR related issues will be developed and issued in appropriate formats for distribution to educational, vocational training, and technical institutions. They will be made available to all partners.
iii. Networking mechanisms will be established for information dissemination and for monitoring the implementation of activities for sustainable development of rice-based production systems.
iv. National projects will be formulated and initiated for implementing policies and programmes that are required for sustainable development of rice and rice-based production systems within the national agricultural development context.

Community outputs:

i. Programmes for strengthening the linkages between partners at the local level will be designed and implemented.
ii. Networking between local, national, regional and international partners will be developed and implemented.
iii. Mechanisms for ensuring local empowerment and participatory approaches in resource use and general rice development decisions will be established.

Beyond 2004

49. The IYR will establish a framework for enhancing sustainable development of rice-based production systems and provide some of the means for achieving sustainability. However, sustainability must be rigorously pursued following the conclusion of the IYR. After observance of the IYR in 2004, FAO will collaborate with partners in establishing and assisting follow-up activities.

VII. Concluding Remarks

50. The UNGA decision to observe an International Year of Rice is timely. It offers an important opportunity to use a collective approach towards resolving increasingly complex sustainable development of rice and rice-based production systems, which have important technical, political, economic and social dimensions. More than half of the world's population rely on rice for its staple sustenance, particularly in developing countries. Myriad rice recipes, uses, and products illustrate the international appeal and cultural significance associated with the food. By-products of rice are fed to livestock, fish, other aquatic organisms, and wildlife. Rice and rice by-products are the starting point in many food chains that lead to daily food on the table. Rice cultivation and post-harvest activities provide employment to several hundred million people in low-income countries, thus improvements in rice-based production systems are closely linked to poverty alleviation. Rice and rice-based production systems maintain water, assist in land reclamation, provide a habitat for fish, livestock, beneficial insects and other wildlife, help reduce soil erosion, aid in carbon sequestration and their natural beauty can be harnessed for economic initiatives related to eco-tourism and cultural awareness activities. The complexity, diversity and utility of the rice-based ecosystems underscore the need for a coordinated, international approach to sustainable rice development. The mission of the Year is to achieve a more sustainable increase in rice production, thus leading to less hunger, better nutrition, less poverty and a better life.