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Organización  
de las  
Naciones  
Unidas  
para la  
Agricultura  
y la  
Alimentación

## CONFERENCE

### INTERNATIONAL CONFERENCE ON AGRARIAN REFORM AND RURAL DEVELOPMENT

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#### ISSUE PAPER THREE

### NEW OPPORTUNITIES FOR COMMUNITY DRIVEN RURAL DEVELOPMENT

#### Summary

Rural development is still an essential component of sustainable development strategies for three reasons:

1) As a social imperative, through social inclusion by 'decent work': Since we have entered the age of de-industrialization, where hi-tech industries create few jobs, rural areas will continue to provide crucial opportunities for 'decent work' (i.e. work with reasonable pay and acceptable work conditions) to the billions of rural people who will not be able to be absorbed by urbanization (the latter concept being understood as applying only to those who have a decent work, a decent shelter and conditions to participate in civic and community life)

Opportunities for rural employment should be sought in both the farm and non-farm sector (which currently accounts for 40 to 60% of rural income in developing countries), following employment-led development strategies which combine the multifunctionality of rural economy and pluriactivity of rural folks. Such opportunities include:

- The upgrading of existing agricultural practices, both in terms of productivity and working conditions;
- The modernization of subsistence activities, so as to release time for new market-oriented and/or non-economic activities (especially for women);
- The Diversification of agricultural production by adding new niches with preference for products which require high inputs of labour;
- Whenever possible, the starting of local small scale agro-processing industries;
- The exploration of new forms of market organization, in particular through collective entrepreneurship;
- The identification of off-farm employment opportunities;
- The promotion of small scale non-agricultural businesses.

2) As an environmental imperative, through the promotion of the 'making good use of nature' by peasant societies: At times of high oil costs and risks caused by climate change, some of the most promising avenues to achieve this relate the coming-of- age of agroenergy and other opportunities offered by markets for environmental services.

3) As a sector with significant multiplier effect on the rest of the economy: This should be achieved through the expansion of 'internal markets', which are key elements of the strengthening of the competitiveness of national economies. As such they can be considered as essential elements of 'development from inside', considered by many as

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an essential engine of growth in developing countries. Three elements will be important to pro-rural and pro-poor development strategies:

A) *Pro-active (neo) developmental States*, with the particularly important functions of regulating and re-governing markets; which is more likely to ensure for patterns of virtuous growth which are both socially inclusive<sup>1</sup> and environmentally sustainable;

B) *Participatory and negotiated territorial development*, as a basis for local development along the following principles:

- Actor based
- Territory-based;
- Dynamic;
- Systemic;
- Multi-sectoral;
- Multi-level, and ;
- Participatory and negotiated.

C) *The invention of a modern biomass-based civilization*; which goes much beyond the production of food alone, as it encompasses food and animal feed, green fertilizers, biofuels, industrial feedstock, construction materials, pharmaceuticals and cosmetics. The elements presented above should form the basis of an innovative world-plan aimed at small-scale farmer, and should coordinated by FAO. It would concern both:

- the eradication of hunger, primarily through the expansion environmentally-friendly and collective farming enterprises, and ;
- the promotion of agro-energy, compatible with the sustainable management of life systems.

The compatibility between these two components should be ensured through ascertaining the potentials of life supporting systems. Research priorities to support the implementation of such world plan should concern biotechnologies, integrated food-energy production systems and novel use of agricultural and forest waste, scope and limits of genetic, improved access to technological innovations and modern communication means. Other elements of such plan would include:

- Promotion of non agricultural employment would constitute another, starting with a stock-taking of pertinent experience;
- Time-and target-bound agrarian reforms, with means to regularly and efficiently review progress
- Participatory and negotiated territorial development.

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<sup>1</sup> Dudley Sears used to say that whatever the rate of economic growth, one cannot speak of development unless progress is observed with respect to reduction of unemployment, social inequalities and poverty.

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## Introduction

1. ICARRD's Meeting in Porto Alegre is profoundly symbolic. Sixty years ago, the Brazilian physician and social scientist Josué de Castro published his seminal *Geography of hunger* which left a durable imprint on FAO's thinking and action. The book was influential for two reasons: it vigorously denounced the scandal of endemic hunger amidst plenty and, at the same time, it showed that all social problems need to be mapped, pointing out in this way the importance of territorial and ecological dimensions in the development debate. ICARRD is revisiting the agrarian reform agenda more than a quarter century after the last FAO conference on the subject and meeting in Brazil, a country that maintains land reforms high on its political agenda<sup>2</sup>. The venue is Porto Alegre, a city internationally known as the site of World Social Forums which have been helping to shape new ideas and practices of participatory democracy<sup>3</sup>.

2. Moreover, the conference is being convened at a moment when new opportunities for rural development are emerging with the coming of age of biofuels in response to the sharp increase in oil prices. As will be argued in this paper, the end of the oil age has begun. The challenge of the forthcoming decades will be to use the expanding production of ethanol and biodiesel as a lever to promote socially inclusive, environmentally sustainable, community driven rural development.

## I. Chapter 1: Why rural development?

3. Rural development still matters<sup>4</sup> for three reasons. Firstly, history does not always repeat itself; massive migration of rural redundant manpower from Europe to the Western Hemisphere in the 19<sup>th</sup> century and then from countryside to cities, as it occurred in the post-war period in industrialized countries, cannot be replicated on a worldwide scale. The age of Fordist industrialization is over; we have entered the age of de-industrialization<sup>5</sup>. High-tech industries

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<sup>2</sup> From 1964 to 1984 the military government distributed land to 77 thousand families. From 1985 to 1994, over 140 thousand families benefited from land reform. From 1995 to 2001, the government of F.H. Cardoso settled 584 thousand families on 19.7 million hectares. The present government's target, likely to be fulfilled, is 400 thousand families for the period 2003-2006 (data quoted from Filippi, E.E., 2005, *Reforma agraria*, UFRGS Editora, Porto Alegre, p.56). All together agrarian reform has involved over 1 million families, and many tens of millions of hectares of land. However, the agrarian structure of Brazil is still one of the most unequal in the world. Some of the figures quoted above are subject to controversy mainly because of some double counting. For a globally positive assessment of the working of land reform settlements see Leite, S., Heredia, B. and Medeiros, L. (coordinators), 2004, *Impactos dos assentamentos: um estudo sobre o meio rural brasileiro*, NEAD, Sao Paulo, Sparovek, G., 2003, *A qualidade dos assentamentos da reforma agraria brasileira*, USP/MDA/FAO, Sao Paulo, França, C.G. and Sparovek, G., 2005, *Assentamentos em debate*, NEAD, Brasilia. The Brazilian land reform has also his detractors; see e.g. Graziano, Xico. 2004, *O Carma da Terra*. São Paulo: A Girafa. As far as family agriculture in Brazil is concerned, the classical study is FAO's sponsored report by Guanzioli, C.E. et al., 2001, *Agricultura familiar e reforma agraria no século XXI*, Garamond Ed., Rio de Janeiro. See also Abramovay R., 2003, *O futuro das regioes rurais*, Editora da UFRGS, Porto Alegre and Meirelles de Souza Filho, h. and Batalha, M.O. (org), 2005, *Gestao integrada da agricultura familiar*, EdUfSCar, Sao Carlos.

<sup>3</sup> See on this point De Sousa Santos, Bonaventura (2005) *O Forum Social Mundial: Manual di uso*, Cortez editora, San Paolo, chapter 4: o FSM e o Futuro; Das utopias realistas às alternativas.

<sup>4</sup> Quite significantly the ILO *World Employment Report* :  
dedicated its chapter 3 to the question: 'why agriculture still matters' .

<sup>5</sup> On the impact of precocious de-industrialization on developing countries see Palma, Gabriel, 2004, *Four sources of 'de industrialisation' and a new concept of the 'Dutch Disease'* (in publication), author's e-mail: gabriel.palma@econ.cam.ac.uk

hardly create new jobs, the focus being on increases in productivity<sup>6</sup>; we are thus condemned, so to speak, to look for new opportunities of work in their rural settings, both in agriculture and outside it, so long as we agree about the centrality in the development agenda of ‘*decent work for all*’ as defined by ILO.

4. Agriculture still accounts in 2005 for 40.1 per cent of total employment in the world. In South East Asia and the Pacific this share is 43.3 per cent, in East Asia, 49.5 per cent, in South Asia 61.2 per cent and in Sub-Saharan Africa 63.6 per cent. By contrast, in Latin America and the Caribbean it is only 17.1 per cent, while in Developed Economies and in European Union it shrank to 3.7 per cent<sup>7</sup>. Commenting on this data, the ILO study just quoted points to the fact that agriculture still has the highest employment share of all three sectors – agriculture, industry, services. And given that the vast majority of the world’s poor live in Asia and Africa, working out of poverty means ensuring that jobs in the agricultural sector provide a decent living. What is more, workers tend to move directly from agriculture to services, rather than to industries, in most cases, to low paid, precarious jobs, under bad conditions in the urban “informal economy”<sup>8</sup>. Hence the importance of looking at nonagricultural rural employment opportunities, bearing in mind that in many Latin American countries the average share of nonagricultural income in rural households already accounts for 50 to 60 percent<sup>9</sup>.

5. Secondly, the potential for a new cycle of rural development still exists. It is necessary to grow more food to ensure universal respect of the right to food and a wide range of goods can be derived from land, forest and water grown biomass: food, feed, green fertilizers, biofuels, industrial feedstock, fibers and plastics, building materials, pharmaceuticals and cosmetics. The emerging markets for biofuels may bring a lasting contribution to the mitigation of the climate change. However, this relationship is by no means simple, given the growing evidence that for the moment being firewood and charcoal production increases deforestation. Predatory uses of native forests must be banned.

6. The challenge is to make rural development socially inclusive and environmentally sustainable by promoting dully modernized, peasant, small-scale agriculture, while at the same time bringing some of the amenities of urban life to the countryside, starting with universal networks of social, educational and health services. Time is short to make Poverty History. As Nelson Mandela put it “*massive poverty and obscene inequality are such terrible scourges of our times -times in which the world boasts breathtaking advances in science, technology, industry and wealth accumulation- that they have to rank alongside slavery and apartheid as social evils*”<sup>10</sup>. Juan Somavía, ILO Director-General, has just reminded us that we are facing a *global jobs crisis of mammoth proportions and the deficit in decent work that isn’t going to go away by itself*<sup>11</sup>.

7. Thirdly, rural development has a multiplier effect on the rest of the economy. A World Bank Report on Latin America and Caribbean found that the rural population is around 42 percent of the total, as compared with the official statistics of 24 percent and that one-percent growth on agricultural GDP was associated with the 0.12 percent growth in non-agricultural

<sup>6</sup> In relation to the employment elasticity of growth, it should be remembered that the rate of growth is approximately equal to the rate of increase in productivity plus the rate of increase in employment ( $r=p+e$ ). Jobless growth occurs when  $p$  is equal to  $r$ .

<sup>7</sup> ILO, 2006, *Global Employment Trends*, Geneva.

<sup>8</sup> According to the ILO study “given these trends, there is a need to reformulate development strategies; reality no longer follows economic theory.” (in this case, the theory that surplus rural labour will be absorbed by urban industries).

<sup>9</sup> World Bank, 2004, *Beyond the city. The Rural Contribution to Development*, Washington.

<sup>10</sup> Mandela, Nelson, *Fighting World Poverty, The Africa Report*, n°1, May 2005, p. 14

<sup>11</sup> ILO News, 24 January 2006.

production<sup>12</sup>. Expanding internal markets is the cornerstone of ‘development from inside’, advocated by Osvaldo Sunkel and the Latin American neo-structuralists<sup>13</sup>, which should not be mistaken for ‘inward looking development’. Dynamic internal markets strengthen the systemic competitiveness of national economies.

## A. THE SOCIAL IMPERATIVE

8. The twentieth century will enter history as a period of unprecedented demographic growth and accelerated urbanization. Demographers project a stabilization of the world population by the middle of the present century. At the same time, they anticipate the increases in urbanization. At this moment, according to UN statistics, about half of the world population already lives in cities. This is a sharp increase from 1950 when the relative share of urban population was only 29.1 per cent. If the prevailing trend is extrapolated to 2050, the urban population would reach two thirds of the total, leaving rural population stabilized at the present level with some three billion additional people moving to cities.

9. This is a staggering prospect indeed, signifying the need to double in only half a century all urban infrastructures existing at present. It should be seen as a threat more than as a symbol of social progress, whatever the civilizational merits of the cities.

10. The main question is how to provide in the urban setting opportunities of decent work for all these newcomers and their descendants, many of whom are refugees from the depressed countryside rather than migrants attracted by the mirage and lights of modern cities<sup>14</sup>?

11. The ILO concept of decent work implies reasonable pay, as well as acceptable conditions and relations of work. Development should not be confounded with survival strategies, nor should we envisage the reproduction of the plight of the migrant workers in China known as *mingong*<sup>15</sup>. Pursuing this argument, we ought to give a far more restrictive meaning to the world urbanization; it should apply only to those who have a decent work, a decent shelter and conditions to participate in civic and community life. Millions and millions of dwellers, eking out miserable livelihoods in shantytowns and depressed neighborhoods through an array of informal, insecure and poorly paid activities, are not urbanized, at least as yet<sup>16</sup>. They are at best candidates for future urbanization, which will require high investments in infrastructures, housing and

<sup>12</sup> World Bank, 2004, Beyond the city. The Rural Contribution to Development, Washington.

<sup>13</sup> See Sunkel O., (ed), 1993, Development from within: Toward a Neostructuralist Approach for Latin America, Boulder, Lynne Rienner. See also Sachs, I., 2001, Um projeto para Brasil : a construção do mercado nacional como motor do desenvolvimento, pp. 45-52, in : A grande esperança em Celso Furtado. Ensaios em Homenagem aos seus 80 anos / edited by Luiz Carlos Bresser-Pereira and José Marcio Rego.- São Paulo : Editora 34.

<sup>14</sup> Cities are attractive as ‘lotteries of life’ as beautifully expressed by the French 19<sup>th</sup> century historian Jules Michelet: “*La ville, un abîme inconnu, est (vue de loin) une loterie; là peut-être on aura des chances, tout au moins la misère plus libre.*”.

<sup>15</sup> See in particular Chen Guidi and Chun Tao, Zhongguo nongmin diaocha (enquête sur les paysans chinois), published in Beijing, January, 2004 quoted by Cohen, P. and Richard, L., 2005, La Chine sera-t-elle notre cauchemar? –les dégâts du liberal-communisme en Chine et dans le monde, Mille et une nuits, Paris.

Joshua Muldavin quotes official estimates of 74 thousand rural unrest episodes in China in 2005 primarily motivated by seizure of peasant land for non-agricultural uses. He estimates at 200 million the migrants who wander across the country in search of work and at a staggering 70 million the number of landless peasants according to official estimates (Muldavin, J., Land grabs, Inrural China, a time bomb is ticking, International Herald Tribune, January 2, 2006). According to the China Human Development Report 2005, just released by UNDP, 250 million Chinese were lifted above the poverty line in the last quarter of century. However, the gap in income per capita between urban and rural dwellers has doubled in the same period. The report advocates the extension of social security rights to all workers, including the migrants from the countryside estimated in 150 million persons.

<sup>16</sup> Many cities in developing countries are unable to cope with ‘premature urbanization’. This is particularly the case of African cities, where around 72 per cent of the total urban population live in slums, threatened by eviction, lacking access to water, sanitation and other services. In Nairobi, almost a million people live in Kibera, the largest contiguous area of slums (Commission for Africa 2005, Our common interest: an argument, Penguin books, London, p.83) .

provision of meaningful employment. In an optimistic vision of the future, shantytowns can be compared with purgatories<sup>17</sup>.

12. Thus, we ought to examine with great care the comparative costs of creating opportunities for decent work in urban and in rural settings, including in this an evaluation of the *faux frais* of urbanization, manifested in the costly construction of architectural symbols of power, wealth and technological prowess.

13. Two comments are in order here. From the methodological point of view, the dichotomy between rural and urban does not make much sense, insofar as we are in the presence of a rural-urban continuum. That is why the OECD has been increasingly using the three categories of rural, urban and intermediary settings<sup>18</sup>.

14. From the substantive point of view, over forty per cent of the working population in developing countries consist of small peasants and agricultural workers and 75 per cent of all those classified as poor belong to this category. In René Dumont's words, the peasants are "*the silent majority of the modern world- half of the world population and much more in underdeveloped countries- the true proletarians of Modern Times*"<sup>19</sup>.

15. In agriculture, the productivity gap between modern and traditional techniques is very high indeed it may reach in extreme cases a ratio of 500 to 1 or even 1000 to 1. In other words, the danger exists of wiping out the majority of traditional farmers if agricultural policies are left to the free interplay of market forces.

16. We cannot totally exclude the possibility of a catastrophic scenario with an emptied countryside, half used by hypermodern agriculture without people and half transformed into natural mega reserves to meet the environmental imperatives, with three billion refugees from the countryside crowded in emergency camps and endless shantytowns. That is why, far from being an anachronic question, rural development appears as a major social challenge for our century.

17. The following figures used by Samir Amin, chairman of the World Forum for Alternatives and Director of the Third World Forum in Dakar, speak for themselves<sup>20</sup>. Peasants who benefited from the green revolution, but are poorly mechanized, produce between 100 and 500 quintals of grain equivalent per worker, while those who were bypassed by this revolution have a productivity of barely ten quintals per worker. On the other hand, the highly modernized capitalist agriculture, which employs only a few tens of millions of farmers, who ceased to be peasants, reaches between 10 and 20 thousand quintals of grain equivalent per worker and per year.

18. If some 20 million additional modern highly mechanized farmers are given access to land, which would have to be subtracted from peasants, and to capital in order to buy the necessary equipment, they could produce the bulk of what urban consumers buy at present from peasants.

19. What will happen to those billions of human beings, most of whom are already the poor among poor? According to Amin, at best a third of them could be absorbed by the cities on the unrealistic assumption of a steady industrial annual growth rate of 7 per cent over the next 50 years. The other two-thirds would swell out the shantytowns in search of survival.

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<sup>17</sup> For a history of the concept of purgatory see Le Goff, Jacques, 1991, *La naissance du purgatoire*, Gallimard, Paris and , by the same author, 1997, *La bourse et la vie*, Hachette, Paris. See also Abramovay, R. & Sachs, I. 1996. "*Nouvelles Configurations Villes-Campagnes*", FAO: Rome.

<sup>18</sup> See on this point Veiga, José E. da, 2002, *Cidades imaginaries: o Brasil é menos urbano do que se calcula*, Autores Associados, Campinas.

<sup>19</sup> Dumont R., 1978, *Paysans écrasés, terres massacrées*, Robert Laffont, Paris.

<sup>20</sup> Amin, Samir, 2005, *Pour un monde multipolaire*, Editions Syllepse, Paris, p. 50-55

20. Under these circumstances, it is necessary to accept the permanence of peasant agriculture throughout the 21<sup>st</sup> century. “*The agrarian question, far from having been solved, is more than ever in the center of major challenges that mankind will have to face in the 21<sup>st</sup> century. The answers that will be given to this question will shape in a decisive way the course of history*” (p.53). One does not have to follow Samir Amin in all the arguments developed in his book, to recognize the centrality of rural development, and hence, the agrarian question.

21. In fact, we face a double challenge: how to improve the livelihoods of the three billion men and women, who live at present in the countryside, many of them in extreme poverty? And how to provide opportunities for at least part of the population increase still to come before 2050?

22. This is a daunting task which cannot be solved by agricultural development alone. Rural development must include an important component of non-agricultural employment, self-employment and petty businesses. As for peasant agriculture, its strength lies on the one hand in its extraordinary resilience and ability to survive in adverse conditions, and, on the other hand, in its capacity to combine market oriented, subsistence and non-monetary investment activities, agriculture, agroforestry and cattle breeding together with seasonal artisan work, as well as part-time jobs in the secondary and tertiary sectors, not to mention the functions performed as guardians of the landscapes and natural resources. Pluriactivity is the key word for understanding the future of rural areas<sup>21</sup>.

## B. SOCIAL INCLUSION BY DECENT WORK

23. According to ILO about 30 per cent of the economically active population in the world consists of the unemployed, the underemployed, and the so-called “working” poor. Whatever the importance of compensatory social policies and handouts distributed to the poorest strata of the population, provision of decent work for all constitutes the main social challenge of development, the only lasting solution to the plight of the poor. Economic growth by itself does not necessarily bring about development. Truly *pro-poor* policies ought to promote virtuous inclusive growth (as opposed to socially perverse growth), leading to a simultaneous reduction in unemployment, social inequalities and poverty<sup>22</sup>.

24. In the search for opportunities for decent work in rural settings, the following avenues should be explored:

- Upgrading of existing agricultural practices in order to increase labor productivity and achieve the partial or total elimination of painful, hard physical work, while improving

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<sup>21</sup> The publication in English in 1966 of the seminal work by the Russian sociologist Chayanov, at that time suppressed in Soviet Union, provoked an intense scientific debate on the nature and specificities of peasant economy and society and the historical role of peasants (A.V.Chayanov, The Theory of Peasant Economy, ed. Daniel Thorner, Basile Kerblay and R.E.F. Smith., Homewood, IL: R.D. Irwin, 1966).

It is impossible to condense in a footnote the extensive literature on the subject. My personal thinking has been mainly influenced by the following writers: W. Kula, J. Tepicht and J. Kochanowicz in Poland, Daniel Thorner and K.N. Raj in India, Solon Barraclough, Jacques Chanchol, Rodolfo Stanvenhagen and Arturo Warman for Latin America, René Dumont and Marcel Mazoyer in France, T. Shanin and E. Hobsbawm in the U.K. The Journal of Peasant Studies remains the main reference. See also Shanin, T., 1989, Peasants and peasant societies, Blackwell Publishers, Oxford; Sahlins, Marshall D., Stone Age Economics (New York: Aldine, 1974), Mazoyer, M. and Roudart, L., 1997, Histoire des agricultures du monde : du néolithique à la crise contemporaine, Seuil, Paris and the delightful Le voyage de mon frère Alexis au pays de l'utopie paysanne, an utopian novel written and published under a pseudonym by Chayanov in the early post-revolution period (L'âge de l'homme, Lausanne).

<sup>22</sup> For a conceptual discussion of inclusive development see Sachs I., Inclusive development and decent work for all, International Labour Review, Volume 143, 2004/1-2 and ILO, 2004, A fair globalization: Creating opportunities for all, Report of the World Commission on the Social Dimension Of Globalization, Geneva. See also United Nations, 2005, The Inequality Predicament, New York.



simultaneously the yields per hectare, so as to offset through higher income the likely negative impact of modernization processes on employment;

- Modernization of subsistence activities, so as to release part of the time consumed by these activities for new market-oriented and/or non-economic activities<sup>23</sup>;
- Diversification of agricultural production by adding new niches with preference for products which require high inputs of labor, such as vegetables, fruits and flowers, dairy, poultry, biofuels, agroforestry, changing accordingly the crop and activity mix. Introducing integrated systems of food and energy production, also turning agricultural waste into wealth by using it as feed for cattle and fish, as well as a source of biomass energy<sup>24</sup>;
- Whenever possible, starting local small scale agro-processing industries to increase the value added to primary production ;
- Exploring new forms of market organization with special reference to different forms of collective entrepreneurship;
- Identifying the opportunities for part-time or permanent jobs for different members of the household outside the farm, in social services as well as in the secondary and tertiary sectors of the economy;
- Starting, whenever suitable, small scale non-agricultural businesses (accommodations for tourists, restaurants, shops, transport of passengers and goods, school busing, etc.).

25. A caveat is in order here. Important as it may be, rural development should not be taken, however, as *pars pro toto*. It should be replaced by a broader development aimed at maximizing opportunities of decent work. A three-pronged approach seems appropriate.

26. Great emphasis must be given to the expansion of universal networks of social, educational and health services which act directly on the well-being of the whole population, including the poor.

27. To induce the necessary structural changes in the economy, the bulk of investment should go to the modernizing core of the economy led by high-tech industries. While these industries create very little direct employment, they generate, upstream and downstream, a significant number of indirect jobs and small businesses<sup>25</sup>.

28. To avoid the trap of jobless growth it is necessary, however, to explore all the possibilities of employment-led growth besides rural development, particularly in the realm of production of 'non-tradable' goods and services which, by definition are not submitted to foreign competition and allow, thus, greater margins of freedom for the choice of labor intensive techniques. Thus, Public works and construction should be looked at with special care, insofar as they provide many

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<sup>23</sup> The latter point is particularly important for women, insofar as they spend many hours per day in routine domestic chores.

<sup>24</sup> India has been very successful in using cattle to convert crop residues into milk expanding production more than fourfold between 1951 and 2002 and overtaking the United States as world's leading milk producer India's milk is produced by some 70 million small farmers, organized in a network of cooperatives, owing one to three cows and almost entirely using farm byproducts and crop waste to feed them (see Brown, Lester R., 2003, Plan B: Rescuing a Planet under Stress and a Civilization in Trouble, W.W. Norton, New York, .p. 141-142). This book by a leading environmentalist, who in his earlier writings took an alarmist view about the impending menace of food shortages, contains many examples of spectacular increases in land and water productivity as well as progress in drip irrigation, mainly derived from China's and India's experience.

<sup>25</sup> The linkages between large modern enterprises and small businesses upstream and downstream ought to be carefully explored and encouraged through public policies aimed at building positive synergies between them.

jobs and, at the same time, improve the infrastructure that is badly needed to make strengthen the systemic competitiveness of developing economies.

29. In a seminal article, M. Kalecki showed that the true limits to finance employment-led growth without generating inflationary pressures are to be seen in the capacity of a country to produce and/or import the wage goods necessary to offset the additional demand arising from the salaries paid to workers engaged in labor intensive activities<sup>26</sup>. In other words, the pace of expansion of public works and housing construction depends on the dynamism of the agricultural sector and its ability to meet food security needs in a situation of greater demand for staple goods.

### **C. THE SUSTAINABILITY IMPERATIVE: MAKING GOOD USE OF NATURE**

30. Environmental sustainability is, side by side with social inclusiveness, the second leg of the concept of development (the third being the economic sustainability without which things do not happen and the brightest ideas vanish).

31. Since time immemorial, peasants perform the function of guardians of landscapes and natural resources. In a sense, environmental prudence has always been present in peasant rationality. Their survival and that of their children and grand-children depends on careful husbanding of nature, conserving soils and water, parsimonious use of forest resources and planting of slow growing trees for the sake of future generations.

32. It is essential that in modern times they continue to perform this function. There are even good reasons to reward them for that. A variety of forms are possible: across the board subsidies paid to all small scale farmers, remuneration for specific environmental services or keeping the prices for agricultural goods at a level which compensates the peasants for their unpaid environmental services.

33. Environmental protection is sometimes mistaken for the setting up of natural reserves, which are often violated due to the lack of effective control. This problem can be partly solved by involving neighboring peasants in this task. However, the main effort should go to assisting them in making good use of nature<sup>27</sup>. Sustainable use of natural resources through agriculture and agroforestry is by far the best way of ensuring their conservation. Accordingly, carbon credits should be reserved for socially inclusive economic projects which perform, at the same time, the function of carbon sinks, rather than for financing non-economic afforestation.

34. A critical problem for planetary environmental sustainability is the growing concern over climate change brought about by increased emissions of greenhouse gases. In this context, the production of biofuels should be examined, not only as an economic opportunity for rural development, but also as a very important environmental service, allowing us to move beyond the limited Kyoto objectives.

### **D. AN OPPORTUNITY TO BE SEIZED: COMING OF AGE OF AGROENERGY**

35. What thirty years of environmental discourse failed to achieve, six months of high petrol prices have. 2005 was a turning point as far as the coming of age of biofuels was concerned. The

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<sup>26</sup> See Kalecki M.(1954, 1993),The Problem of Financing Economic Development, *Collected Works of Michal Kalecki*, volume 5, *Developing economies*, p. 23-60, Clarendon Press, Oxford, Sachs I., *L'Economie politique du développement des économies mixtes selon Kalecki : croissance tirée par l'emploi*, *Mondes en Développement*, Paris, vol. 27, n° 106, 1999, pp. 23-34. and Sachs I., 2004, *Desenvolvimento includente, sustentável, sustentado*, Garamond, Rio de Janeiro.

<sup>27</sup> *Du bon usage de la nature* is the title of an important book by Catherine and Raphaël Larrère, 1997, *Du bon usage de la nature*, Aubier, Paris.

Gradual phasing out of petrol consumption and its substitution by biofuels, side by side with the search for greater energy efficiency, are now fully on the agenda of the development debate.

36. Total oil depletion will not occur tomorrow, perhaps not even in this century. But there are good reasons to believe that a structural shift occurred towards higher petrol prices, with dramatic consequences for oil exporting and oil importing developing countries.

37. The former will enjoy windfall profits likely to bring about the so-called Dutch disease. The latter will be confronted with deterioration of terms of trade and balance of payment difficulties. But this predicament may become yet a blessing in disguise by inducing tropical countries to engage in large scale production of bioenergy-ethanol, biodiesel and charcoal from planted forests<sup>28</sup>. With thirty years experience in the substitution of gasoline by sugar-cane ethanol, and a comprehensive Agroenergy Plan for the years 2006-2011<sup>29</sup>, Brazil hopes to transform agroenergy into the crown jewel of its agrobusiness.

38. The break even price of oil for sugar-cane ethanol, 35 dollars per barrel, has been largely bypassed as oil is being sold at about 60 dollars per barrel. According to Brazilian sources, 60 dollars is the breakeven price for biodiesel, however the costs of production of biodiesel are likely to be sharply reduced in the next few years. Insofar as the Clean Development Mechanism, created by the Kyoto protocol, allows for the claiming of carbon credits for the production of biofuels, their costs of production will be accordingly reduced. Moreover, judging by what happened with sugar-cane ethanol in the last 30 years, one may expect a rapid and continued reduction of biodiesel costs in the next decades.

39. Suitable climatic conditions give to tropical countries a permanent comparative advantage in the production of biofuels, both for import substitution of oil and future exports of biofuels likely to become an important commodity.

40. How far and how fast can they move along these lines? What are the limits to be observed? To what extent will the expansion of biofuels production affect the paramount objectives of food security and the protection of native forests?

41. These questions must be answered thoroughly and rapidly on a country by country basis, leaving behind guesses, estimates and prejudices which abound in the literature on the ecological footprint of industrial civilizations, the amount of available cultivable land and water, the yields per hectare of the crops chosen for the production of biofuels, the energy in/energy out ratios, the potential uses of byproducts, the volume of employment to be created, the forthcoming technological innovations, etc. Under no circumstances the current practices of predatory use of forests should be condoned. Nor biofuels ought to be encouraged at the expenses of the food security objectives.

42. A methodological comment is in order here. Most estimates of land requirements for bioenergy disregard the savings likely to result from designing integrated food energy systems instead of juxtaposing production of food and biofuels. Moreover, a key question for the future is the ability to extract biofuels from agricultural waste.

43. It is recommended that FAO play a leading role in undertaking a state-of-the-art study of biofuels production and the natural resources required, so as to provide the answers to the questions just raised.

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<sup>28</sup> For an analysis of the likely impact of the oil endgame on Least Developing countries, see Sachs I., Expensive oil: for Least Developed countries a Quiproquo of curse and Blessing in disguise, paper prepared for UNCTAD, December 2005.

<sup>29</sup> See Ministerio de Agricultura, Pecuaria e Abastecimiento, 2005, Plano Nacional de Agroenergia 2006-2011, Brasilia and Macedo, Isaias de Carvalho (org), 2005, A Energia de Cana-de-açúcar, UNICA, Sao Paulo.

44. Once more, production of biofuels should not be taken as *pars pro toto* of energy strategies. These should rely, first of all, on the moderation of energy demand and greater efficiency in final energy use. Side by side with agroenergy, all other sources of renewable and clean energy must be explored.

### E. THE BROADER CONTEXT

45. This paper has argued that agricultural production encompasses food, feed, green fertilizers, biofuels, building materials; industrial feedstock, pharmaceuticals, cosmetics. Further exploration of biodiversity is likely to lead to new developments in green chemistry. However, agriculture is only part of rural development, as biofuels are only part of agricultural production. The keywords here are: multifunctionality of rural economy, and pluriactivity of rural folk, including seasonal migrations and, in areas located in the proximity of cities, even daily commuting.

46. As already said, income from non agricultural activities accounts already for half or even more of rural households income. Given the limited opportunities for rural urban migration, rural development planners should screen with outmost attention the prospects for nonagricultural employment in the service sector: social, technical, personal, and trade services, environmental services, tourism, eco-tourism (a label that should be regulated), “proximity tourism” of urbanites spending week-ends in non too distant rural areas and beaches. An important study of the Brazilian rural areas conducted by José Graziano da Silva, Clayton Campanhola and a large team of researchers, concluded to the growing importance of jobs related with the upkeep of country and beach houses belonging to affluent middle classes and with the organization of their sport and leisure activities (horse riding, fishing, etc.)<sup>30</sup>. According to some estimates as many as 15 percent Brazilians make their living in activities related to the ‘non working’ time of the Brazilian society. Precise data about these occupations are not yet available<sup>31</sup>.

47. Areas enjoying good climatic conditions and nice scenery may expect to attract growing numbers of retired people who prefer to settle in the countryside, creating a regular demand for many services and goods. The same may happen with high level active professionals who choose to live in the countryside and avail themselves of information and communication techniques to work at distance. Surprising as it may sound, at least in some rural areas the prospect for creating *in loco* a modern ‘service society’ offers a better employment chance than migrating to cities.

48. Modern information and communication technologies favour the redeployment in rural areas of many industries that migrate from overcrowded metropolitan areas in search of lower costs of production and of fiscal advantages. The impact of these industries on living conditions in rural or semi rural areas is a mixed bag: more opportunities of

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<sup>30</sup> See the project “O Novo Rural Brasileiro” which produced several books, in particular:

CAMPANHOLA, Clayton (Org.); SILVA, J. F. G. (Org.) 2004, O Novo Rural Brasileiro: Novas Ruralidades e Urbanização. Brasília/DF: Embrapa Informação Tecnológica, v. 7. 216 p.

CAMPANHOLA, Clayton (Org.); SILVA, J. F. G. (Org.), 2004, O Novo Rural Brasileiro - Novas Atividades Rurais. Brasília/DF: Embrapa Informação Tecnológica, v. 6. 308 p.

CAMPANHOLA, Clayton (Org.); SILVA, J. F. G. (Org.), 2004, O Novo Rural Brasileiro - Rendas das Famílias Rurais. Brasília/DF: Embrapa Informação Tecnológica, v. 5. 495 p.

CAMPANHOLA, Clayton (Org.); SILVA, J. F. G. (Org.), 2000, O novo rural brasileiro: políticas públicas. 1. ed. Jaguariúna/SP: EMBRAPA, v. 4. 176 p.

<sup>31</sup> Sebrae is starting a research on the beach as a space of conviviality and work. It will be very interesting to know how many people work on Brazilian beaches on a sunny week-end and in what capacities. The same approach can be extended to other areas which attract the proximity tourists (e.g. the Tijuca forest in Rio de Janeiro, other natural parks, etc.)

employment on the one hand and, on the other, higher real estate prices on account of the inflow of qualified manpower.

49. The appeal of rural areas to these kinds of new rural settlers will of course depend on the provision of such public goods like the networks of social, educational and health services and on the improvement of infrastructures.

50. The latter are crucial for all businesses that get started and for the rural urban linkages, tourism and commuting. That is why it should be given a very high priority in the rural development planning, the more so that it is by nature labour intensive. Considerable scope for expanding local public works on credit exists if the supply of wage goods is elastic; it is time to revisit Keynes.

## F. CONCLUDING REMARKS:

51. We have seen that compelling social and environmental considerations speak in favor of rural development as a major component of development strategies for the century. Completing the unfinished agenda of agrarian reform is a precondition to address the question of how to get there. As agrarian reform will be treated in detail in another session of ICARRD, only one comment will be made here on this subject<sup>32</sup>. Regulation of access to land and of property rights is the cornerstone of agrarian reforms. To be effective, they ought to include a package of simultaneous pro-peasant public policies granting access to knowledge, training, appropriate techniques and extension services, access to credit and different forms of concessionary financing, as well as access to local, national and global markets at fair prices through equitable and transparent contracts with agro-industries and distribution chains, direct sales to consumers and public purchase contracts.

## II. Chapter 2: How do we get there?

52. The already quoted World Bank Report (2004) points to the need of giving a greater pro-rural and pro-poor bias to public policies. This calls for the streamlining of the institutions responsible for designing and implementing developmental policies.

### A. PRO-ACTIVE (NEO) DEVELOPMENTAL STATES

53. Institutions matter the most important among them are the national States. In the age of globalizing economies, they have still important functions to perform, starting by that of governing and regulating markets<sup>33</sup>.

54. The latter are by nature short-sighted and insensitive to social and environmental concerns. Left to themselves they tend to generate socially perverse and environmentally disruptive patterns of economic growth. Misdevelopment (maldéveloppement) is the

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<sup>32</sup> See the following papers prepared for ICCARD: Agrarian Reform, Social Justice and Sustainable Development, paper prepared by Sergio Leite, Policies and practices for securing and improving access to land, Poverty and land access, Paper prepared by Camilla Toulmin and Lorenzo Cotula.

<sup>33</sup> To those who claim that in the age of globalization the developmental functions of the State become obsolete and redundant, advocating the primacy of market mechanisms and invoking the example of the United States, one may reply by paraphrasing the title of an article by Paul Krugman: 'Don't do what we say, do what we do', Ha-Joon Chang's book *Kicking Away the Ladder – Development Strategy in Historical Perspective*, (2002, Anthem Press, London) shows that none of the today developed countries achieved its present status without State intervention.

appropriate word to qualify them. The term development should be reserved for patterns of virtuous growth which are both socially inclusive<sup>34</sup> and environmentally sustainable.

55. The forthcoming decades will see the emergence of new forms of 'mixed economies' (public-private) and the coming of age of a new generation of developmental States, lean, clean and pro-active, sharply differing from the various forms of bureaucratic Statism which prevailed in the last half-century.

56. These (neo)-developmental States will have to be built on the basis of a thorough critical assessment of the achievements and shortcomings of the first generation of developmental States, of the rise and fall of real socialism, of the failures of the alternative neo-liberal policy package known as the Washington Consensus and of the impasses of the social-democracy caught in the oxymoron 'unqualified yes to market economy, no to market society'<sup>35</sup>.

57. In the author's view, the developmental States ought to assume the following responsibilities:

- Articulation between development spaces, from local to transnational, passing through regional and national, the most vulnerable being the interface between the national and the global economy<sup>36</sup>. Pro-peasant policies may require delinking of internal prices from world prices. Articulation of local spaces with the national one calls for establishing interplay between top-down and bottom-up approaches.
- Harmonizing the social environmental and economic objectives through strategic, flexible and participative planning, decent work for all being the central concern.
- Building partnerships between stakeholders on the development process by means of quadripartite negotiations between the State, the workers, the entrepreneurs and the organized civil society.
- Financing on concessionary terms of investment in priority areas indicated by strategic plans.
- Stimulating the stream of innovations accessible to small scale farmers by promoting relevant public research.

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<sup>34</sup> Dudley Sears used to say that whatever the rate of economic growth, one cannot speak of development unless progress is observed with respect to reduction of unemployment, social inequalities and poverty.

<sup>35</sup> For a classical analysis of the developmental State in Japan see Johnson, Chalmer, MITI and the Japanese Miracle: Growth of Industrial Policy 1925-1975, Stanford University Press, 1982. See also Wade, Robert, 1990,2003, Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization, Princeton University Press, Stiglitz, Joseph, Globalization and Its Discontents, W.W. Norton & Company, June 2002, Chang , Ha-Joon,2005, The East Asian Development Experience: The Miracle, the Crisis and the Future , Zed Books, London. See also Sachs, I., 2000, Undersatnding Development : People, Markets and the State in Mixed Economies, Oxford University Press, New Delhi and Sachs, I.,1999, O Estado e o parceiros sociais : negociando um pacto de desenvolvimento, pp. 197-217., in : Sociedade e Estado em transformação / edited by Luis Carlos Bresser Pereira ; Jorge Wilhem and Lourdes Sola. - São Paulo : Editora UNESP ;

<sup>36</sup> This is once more an area where equity calls for an equal treatment of partners of unequal strength with rules of game based in favor of the weaker partner, in occurrence the developing countries which suffer from the prevailing pattern of asymmetric globalization.

## B. PARTICIPATIVE AND NEGOTIATED TERRITORIAL DEVELOPMENT (PNTD)

58. Historically the top-down approach dominated the development scene. Hence the importance of creating institutional conditions widening the scope for bottom-up approaches.

59. While the ultimate goal of development is reduction of social disparities, this ought to be done by taking advantage of biological and cultural diversity, leading to a plurality of development paths, which can only be traced to a fairly decentralized level benefiting from the knowledge, experience, imagination and initiatives of local populations.

60. Political considerations point in the same direction: the difficult yet indispensable apprenticeship of direct democracy can only happen at a local level in relatively small communities.

61. The choice of the appropriate territorial scale for local planning ought to be pragmatic. The smaller the community, the greater the opportunities for citizens to participate. On the other hand, if decentralization is pushed too far, the complexity of the development processes is lost from sight. Historical circumstances, ecological configurations and local cultural identities must be taken into account, side by side with economic considerations and administrative expediency. For different subjects, different geometries may be built by pulling local communities into different sorts of consortia and coalitions.

62. The concept of Participative and Negotiated Territorial Development constitutes an excellent basis to design pragmatically the institutional framework for local development, insofar as it is predicated on the following principles:

- **Actor based:** recognition of the heterogeneity of the actors' interests and visions of the territory.
- **Territorial based:** based on territories as spatial units of analysis, shaped by the social and historical relations between the actors and the territory.
- **Dynamic:** understanding of and learning from the complexity of a changing environment to support positive patterns of change and help mitigate negative patterns.
- **Systemic:** assumption of the complexity of a territorial context and the interdependencies within and between territories.
- **Multi-sectoral:** integration of the environmental, social, economic, political, cultural dimensions of the actors' visions of the territory.
- **Multi-level:** integration of different territorial levels and scales in the governance system.
- **Participatory and negotiated:** notion of the territory as a negotiation arena to strengthen dialogue and mutual trust, and increase bargaining power<sup>37</sup>.

63. The concept of PNDT ought to be widely popularized and confronted on a continuous basis with the enormous variety of ongoing experiences in local and territorial development, both in

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<sup>37</sup> FAO, Rural Development Division, 2005, "An Approach to Rural Development: Participatory and Negotiated Territorial Development (PNTD)". See also the following papers prepared for ICCARD: Sustainable communities by Jules Pretty and Le renforcement des capacités des Etats et des Sociétés Civiles pour améliorer l'accès à la terre, à l'eau et aux ressources naturelles, by Michel Merlet, Samuel Thirion and Vicent Garces. .

developing and industrialized countries<sup>38</sup>. FAO should continue to act as a clearing house on this very important aspect of rural development.

64. Local development should not be mistaken, however, with '*autarchic localism*', a closing of the local community on itself. It should aim at fostering cooperation among all stakeholders of development present in the community to promote the '*social construction of innovations*' aimed at a better insertion of the community in the national, and possibly in the global economy<sup>39</sup>. The future does not belong to an archipelago of self-contained communities.

65. A comment is in order here. We ought to take an evolutionary view towards the construction of local institutions for participative and negotiated development. It calls for a long apprenticeship of meaningful participation. The process could start by creating local development forums which, after some time could transform themselves into advisory councils. These in turn could become deliberative at a latter stage. The example of participative planning in the State of Kerala<sup>40</sup> in India points to the importance of associating local populations already in the initial diagnosis, identifying the most urgent local problems but also idle, latent resources and development opportunities<sup>41</sup>.

### C. INVENTING A MODERN BIOMASS-BASED CIVILIZATION

66. The implementation of rural development strategies calls at the same time for a continuous flow of innovations leading to higher yields per hectare, combined with higher labor productivity and a broader range of products derived from biomass.

67. The great civilizations of the past were primarily powered by solar energy harnessed through photosynthesis. The challenge we are facing is to invent a modern biomass-based civilization also powered by solar energy harnessed through photosynthesis, however situated at a completely different and much higher stage of the scientific ascent of Man. The word 'invention' is not misplaced. Celso Furtado was right to say that development requires always some amount of invention.

68. The production function to explore, as far as the developing countries are concerned, has the following characteristics: knowledge and labor intensive and, at the same time, as much as possible capital and resource saving. Furthermore, the solutions proposed ought to incorporate the principles of '*evergreen revolution*' as defined by M.S. Swaminathan: they ought to look for higher yields while respecting rules of environmental sustainability and be appropriate by small scale farmers<sup>42</sup>.

69. As already said, biomass-based civilization goes much beyond the production of food alone. It encompasses food and animal feed, green fertilizers, biofuels, industrial feedstock, construction materials, pharmaceuticals and cosmetics.

70. The starting point to investigate the potentials of biomass-based civilization is the scrutiny of the biodiversity present in different ecosystems. Biotechnologies enter in the game at

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<sup>38</sup> Instead of looking only at the so called "good practices" considerable attention should be given to the analysis of less favourable cases where local vested interests lead to undesirable patrimonial practices. See Abramovay, R. (2005), *A agricultura familiar entre o setor e o território*. ([www.econ.fea.usp.br/abramovay](http://www.econ.fea.usp.br/abramovay))

<sup>39</sup> See Trigilia, Carlo, 2005, *Sviluppo Locale: un progetto per l'Italia*, Editori Laterza, Roma-Bari.

<sup>40</sup> See Isaac, T.M, Franke, R, 2000, *Local Democracy and Development: People's Campaign for Decentralized Planning in Kerala*, New Delhi, Left Word. Brazilian experiences in local development are being collected and analyzed in the ongoing project of the Instituto Cidadania on national policies of support to local development.

<sup>41</sup> The Brazilian government invited the Instituto de Cidadania to prepare (to complete)

<sup>42</sup> Exhaustive information on M.S Swaminathan's concept of evergreen revolution is available on the site of his Foundation [www.mssrf.org](http://www.mssrf.org). The '*evergreen revolution*' is also known as doubly green revolution, insofar as it incorporates the environmental sustainability criteria that were absent in the first green revolution.



two extremes of the production process. On the one hand, they enhance the yields per hectare of the biomass produced; on the other hand, they are instrumental in opening and widening the range of products derived from it.

71. The prospect of biomass-based civilization is particularly bright for tropical countries, which enjoy a permanent climatic comparative advantage with respect to the primary productivity of biomass<sup>43</sup>.

72. Insofar as concrete propositions concerning the production and uses of biomass must be ecosystem, culture and even site specific, progress in this area will be conditioned by domestic research capabilities, much more than by a North-South transfer of techniques. By contrast, the field is wide open for South-South scientific and technical cooperation, as well as exchange of experiences, in particular between countries and regions with similar environmental settings. FAO can act as a clearing house of such experiences, circulating case of sustainable agriculture in progress in developing countries.

### **III. Chapter 3: Beyond Millennium Goals: towards an action plan**

73. To conclude, some suggestions, which follow from this paper, are presented in view of an action plan to promote socially inclusive and environmentally sustainable people-driven rural development.

#### **A. GEOGRAPHY OF HUNGER ZERO**

74. FAO could take the lead in preparing a world plan of eradication of hunger with targets and time-schedules established country-wise for reaching full and universal implementation of the right to food. This goal should be reached primarily by expanding the production of small scale peasant farmers organized in cooperatives and other forms of collective entrepreneurship and applying the principles of evergreen revolution.

#### **B. AGRO-ENERGY WORLD PLAN**

75. In parallel, a medium and long-term agro-energy world plan should be established for the years 2006-2015 and 2016-2025. The plan should be made compatible with the food security goals, and with the objectives of protection of native forests and sustainable management of the life systems. Like the Geography of Hunger Zero, it should primarily address small scale peasant farmers.

#### **C. ASCERTAINING THE POTENTIALS OF LIFE SUPPORTING SYSTEMS**

76. In order to make compatible the two plans it is necessary to ascertain the availability of land, water and forest resources updating the existing prospective studies on ecological footprint of modern civilizations<sup>44</sup>, examining different scenarios of land and biomass uses and

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<sup>43</sup> See Sachs, I., 2000, Brésil : tristes tropiques ou terre de bonne espérance ? Tropicalité, tropicologie et développement, pp.184-201, Hérodote. Revue de Géographie et de Géopolitique, Paris, n° 98 (N° thématique : Nation Brésil), 3e trimestre 2000.

<sup>44</sup> According to J.G. Speth, the environmental losses are already great: half the world's tropical and temperate forests, about half the wetlands and a third of the mangroves. Human kind already consumes or destroys each year about 40 per cent of nature's photosynthetic output leaving too little for other species. (Speth, J.G, The Heart of the Matter, Environment Yale, Fall 2003, p.2 ). The latter figure is key for estimating the limits to the future increases in production

incorporating assumptions about the likely rate of technological progress leading to higher land and water productivity.

#### **D. RESEARCH PRIORITIES**

77. The flow of innovations will depend on the performance of research. The following topics deserve special attention:

- biotechnologies to improve biomass yields per hectare and to expand the range of products derived from biomass;
- designing of integrated food-energy production systems adapted to different biome;
- novel uses of agricultural and forest waste (*turning waste into wealth*) in form of biofuels and animal feed and the corresponding release of grazing lands for agriculture.

78. Two conditions must be met. On one hand, the use of biotechnologies raises important and difficult ethical questions about the scope and limits of genetic manipulation. This is an area where ethics, politics and economics overlap<sup>45</sup>. On the other hand, accessibility of proposed technological innovations to small scale farmers must be taken into account. Appropriate channels for the diffusion of technological innovations in the rural areas must be devised, using the opportunities created by the modern communication technologies<sup>46</sup>.

79. FAO should take the lead in organizing international research programs on these three priority subjects and in promoting around them South-South technological cooperation and exchanges among tropical countries<sup>47</sup>.

#### **E. NON-AGRICULTURAL EMPLOYMENT**

80. Insofar as rural development implies pluriactivity of farmers and members of their families, creation of non-agricultural employment, self-employment and petty enterprises in the rural setting must be encouraged. FAO should set up a clearing house of pertinent experiences in this field, starting with a thorough analysis of the particularly stimulating Chinese experience in this respect.

##### ***Agrarian reforms***

81. Governments should be invited to set targets and time-schedules for the implementation of agrarian reform and FAO should organize, every five years, a conference to share and evaluate country progress reports on the subject.

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of food, biofuels, and other biomass derived products. It should be therefore very carefully studied. Opinions about the ultimate limits of uses of photosynthetic output range from rigid Malthusianism to a wide optimism. According to J.L. Conceição Silva (*Proposta para reforma de setor primario da economia brasileira (1999)*, 2002, Thesaurus, Brasilia) the annual biomass output in Brazil is estimated in 7 billion tons of dry matter, corresponding to an average of more than 8 tons per hectare. On the basis of this estimate, the author reaches the conclusion that theoretically Brazil alone could produce enough food for some 10 billion people.

<sup>45</sup> See Sen, Amartya, 1897, *On Ethics and Economics*, Blackwell Publishers, Oxford.

<sup>46</sup> To celebrate the 60<sup>th</sup> anniversary of Independence in 2007, India proposes to open 600 thousand rural innovation centers within the so-called Mission 2007. The originality of the project consists in the way in which it intends to train villagers in making good use of computer facilities to access technical information.

<sup>47</sup> A first step in this direction was made by the programme « South-South Cooperation on Environmentally Sound Socio-Economic Development in the Humid Tropics », jointly implemented by the UNESCO Man and the Biosphere Programme (UNESCO/MAB), the United Nations University (UNU), and the Third World Academy of Sciences (TWAS). See for additional information: <http://www.unesco.org/mab/activity/s-s/s-home.htm>.

***Participative and negotiated territorial development (PNTD)***

82. FAO should act as a clearing house of information on experiences in PNTD and a source of technical assistance to countries wishing to engage in this directio