



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

HIV/AIDS Pandemic in Africa: Trends and Challenges

Livingstone S. Luboobi and Joseph Y.T. Mugisha

NOTA DI LAVORO 103.2005

SEPTEMBER 2005

ETA – Economic Theory and Applications
--

Livingstone S. Luboobi, *Department of Mathematics, Makerere University*
Joseph Y.T. Mugisha, *Faculty of Computing & Information technology, Makerere University*

This paper can be downloaded without charge at:

The Fondazione Eni Enrico Mattei Note di Lavoro Series Index:
<http://www.feem.it/Feem/Pub/Publications/WPapers/default.htm>

Social Science Research Network Electronic Paper Collection:
<http://ssrn.com/abstract=812847>

The opinions expressed in this paper do not necessarily reflect the position of
Fondazione Eni Enrico Mattei
Corso Magenta, 63, 20123 Milano (I), web site: www.feem.it, e-mail: working.papers@feem.it

HIV/AIDS Pandemic in Africa: Trends and Challenges

Summary

Three-quarters of the world's AIDS population lives in Sub-Saharan Africa; most have no access to lifesaving drugs, testing facilities or even basic preventative health care. One of the major factors inhibiting medical professionals in Africa from treating this disease is the inability to access vast areas of the continent with adequately equipped medical facilities. To meet this need, Architecture for Humanity challenged the world's architects and health care professionals to submit designs for a mobile HIV/AIDS health clinic. The pandemic is changing the demographic structure of Africa and wiping out life expectancy gains. Indeed, in many African countries, life expectancy is dropping from more than 60 years to around 45 years or even less. In this paper, we highlight the uniqueness of factors associated with HIV/AIDS pandemic in Africa and present its impact and challenges.

Keywords: HIV/AIDS, Africa

JEL Classification: I18, J11

This paper was presented at the Workshop on Infectious Diseases: Ecological and Economic Approaches held in Trieste on 13-15 April 2005 and organised by the Ecological and Environmental Economics - EEE Programme, a joint three-year programme of ICTP - The Abdus Salam International Centre for Theoretical Physics, FEEM - Fondazione Eni Enrico Mattei, and The Beijer International Institute of Ecological Economics.

Address for correspondence:

Livingstone S. Luboobi
Department of Mathematics
Makerere University
P.O. Box 7062
Kampala
Uganda
E-mail: luboobi@admin.mak.ac.ug

1. What makes HIV/AIDS Epidemic Unique in Africa?

The Epidemic in Africa is fuelled by ignorance of the people of the disease, lack of access to prevention, inadequate treatment and care services, and stigma and discrimination. Young African girls are dangerously undereducated about AIDS and how to protect themselves from it. UNICEF reports that more than 70% of adolescent girls in Somalia and more than 40% in Guinea-Bissau and Sierra Leone have never heard of AIDS. A number of other factors may help explain why HIV/AIDS has hit Africa much more. Among these are: High incidences of sexually transmitted Infections (STIs), large refugee populations, seasonal labour migrations that allow multiple sexual partners. These range from truck drivers, port and dock workers, seasonal workers, fishermen/women; during the long periods they are away from their partners engage in short-term relationships or temporary marriages. On return, these people end up infecting their partners thus spreading the virus from pockets of high prevalence to the general population

Africa has a range of varying traditions and culture among its countries. Many of these are seen as main contributing factors to the escalating HIV/AIDS pandemic. Notable among these are: (a) **Marriage patterns** in Africa where men prefer younger girls and polygamous tendencies. (b) **Sharing of wives** is common practice among many African Countries. (c) **Widow inheritance** is very popular among African families. (d) **Sexual cleansing** rituals is a very common practice in Africa in which a deceased man's relative has sex with a widow in the belief that this will dispel evil forces in the family. (e) **Sex workers** among many cities in Africa, catapulted by poor leaving conditions in villages that force many girls to take on town life. (f) **Unemployment**: Many girls who go to towns to look for jobs fail to obtain. (g) **Early marriages**: Many girls are married off early and as such miss school where they could learn more about dangers of such diseases. (h) **African people** do not talk about Sexual life in public. (i) **Women left home by mobile population** in many case end up in extra marital sex with neighbours who happen to come to help her while in need of money and other social needs. (j) **Conflict and wars**. Where there has been conflicts and wars, effort to extend HIV/AIDS services have been rendered impossible. The frequent abductions and rape incidences have been the major factors for the high prevalence rate in such regions. (k) **Postpartum Abstinence**: In many parts of sub-Saharan Africa breastfeeding means sexual abstinence of women. This action ensures that the woman is not pregnant until after the breastfeeding period, which can be as long as over two years in some West African countries. In a study in Southern Benin in 1989 [9], reported that over half (53%) of men interviewed favoured extra-marital relations during postpartum abstinence period of wives. Cleland *et al.* (1999) [7], investigated the relationship between duration of postpartum abstinence and extra-marital sex among a sample of 5941 women and 1533 men in Benin in 1996. A logistic regression fitted to the data showed that sex abstinence of women for 1 - 5 and at least 6 months attracted 1.6 and 1.63 times extra-marital sex compared to no abstinence at all. During focus group discussions in Zimbabwe men cited postpartum abstinence by their wives as a reason for extra-marital relationships [11]. In the era of HIV/AIDS epidemic, this is dangerous to both women and men as it can attract HIV infection to the family.

According to UNAIDS 2004 Report [42], Sub-Saharan Africa is a home to close to two-thirds of all people living with HIV/AIDS. The estimate of HIV/AIDS people in Sub-Saharan Africa at 25.4 Million persons with a 7.4% adult prevalence rate, as compared to 2 Million in Latin America, & Caribbean, 1.4 Million in Eastern Europe & Central Asia and 8.2 Million in Asia. South Africa continues to have the highest number of people living with AIDS in the World. Unfortunately there is no sign of a decline in the epidemic. In South Africa, Swaziland, Zimbabwe and Botswana there are worrying ever increasing prevalence rates (with figures of up to 27.9% by end of 2003, up from 2.4% in 1992, for the case of South Africa [44]. In Southern

Africa, thousands of men live away from their families for months at a time to work in gold diamond mines. An estimated one-third of the miners in South Africa have HIV. When these miners return home to their families they introduce the virus to their home communities. Similar indications are expected in mineral rich DR Congo, Zambia and Botswana, and mining towns of Ghana. Swaziland has recently recorded the world's highest HIV/AIDS prevalence (approximately 38.6%), surpassing Botswana [Reuters, May 22 2004]. In Madagascar, there has been an alarming rise in prevalence among pregnant women; it increased by almost fourfold since 2001, to reach 1.1% in 2003.

In West Africa, the epidemic is diverse and changeable. National prevalence has remained relatively low in the Sahel countries, with prevalence around 1%. However, the overall figures can conceal very high infection levels among certain population groups. In Senegal, for example, national HIV prevalence is below 1%, but prevalence rose among sex workers in two cities: from 5% and 8% in 1992, to 14% and 23% in 2002, respectively. Prevalence levels are highest in Côte d'Ivoire at 7%, although Abidjan recorded its lowest level (6%) in a decade in 2002. Benin and Ghana show HIV prevalence in the 2-4% range, with little change over time. Nigeria, with a population of over 120 million, has the highest number of people living with HIV in West Africa. The national prevalence in 2003 was 5.4%. HIV prevalence among pregnant women is over 1% in all states and is over 5% in 13 states [42].

East Africa now boasts of several examples of gradual, modest declines in medium HIV prevalence. In Uganda the national prevalence fell from 30% in early 1990s to 4.3 by the end of 2001 and 4.1% by end of 2003 [2], remaining subsequently at 5% to 6% through the 2004. Uganda's policies are credited with having brought the prevalence rate low. The country is seen as having implemented a well timed and successful public education campaign, reducing the numbers of people indulging in casual sex as well as cutting the HIV prevalence rate.

For the case of Uganda, we highlight the following points:

(a) In 1982 the first AIDS case in Uganda was diagnosed. This was one of the earliest noted AIDS case as compared to other countries in Africa where first cases were reported as later as 1985 in Botswana [40], 1984 in Zambia, [42], 1986 in Cameroon, Nigeria, and Ghana[42].

(b) Between 1982 and 1986 there was little understanding of what AIDS was and what causes it [37]

(c) In 1986 the newly sworn-in President Museveni responded to the emerging HIV crisis in Uganda and swiftly embarked on a nationwide tour to tell people that avoiding AIDS was a patriotic duty, and that they should abstain from sex before marriage and be faithful to their partners and use condoms

(d) Although it did not work immediately because the new government had to settle-in and solve other internal problems such as consistent insurgence, the government maintained AIDS policies among the priority areas and by late 90s, started to see fruits of declining prevalence rate.

(e) There has been an apparent fall in the number of new infections amongst younger people (suggesting that they are more cautious about indulging in potential risky activities) [www.tasouganda.org][45]

(f) The approach used in Uganda is sometimes known as ABC [3] approach. First, encouraging sexual Abstinence until marriage, secondly, advising those who are sexually active to BE

faithful to a single partner, and, especially if you have more than one sexual partner, always to use Condom.

(g) Communication: The message about HIV and AIDS was effectively communicated to a diverse population by the government and by word of mouth. Much of the prevention work that has been done in Uganda has occurred at grass-root levels, with a multitude of tiny organizations educating their peers, mainly made up of people who were themselves HIV positive. This communication has worked in reduction of some risky behaviour, and there is a high level of AIDS awareness amongst people generally. Use of simple messages to disseminate the ABC approach became the major tool to impart the message. In fact, more complicated messages about risky behaviour and safer sex were not spread until later when there had already begun to be a decline in HIV figures [45].

(h) Political openness and honesty about the epidemic have been key factors in exposing the risks and how they can be avoided. This contrasts sharply with countries like Kenya, and later South Africa, which had earlier on lacked this political courage

(i) Of recent, attention has been turned to educating the population to the role of ARVs towards a positive living. The population has seen that treatment with a good and consistent ARV therapy has changed trend of the path to AIDS. There are few deaths!! Persons that were visibly seen with full-blown AIDS symptoms, who would have otherwise died (basing on the past experiences with AIDS patients) have become healthy, fatter and stronger and are back to their jobs. The persons with AIDS have also found that they can live and be helpful to their families and have helped a lot in educating others on the dangers of the epidemic.

(j) People have gained confidence in living with persons with HIV/AIDS because they have them in offices and at home.

(k) The HIV prevalence of 4.1% is still high [45]. It can cause a backward trend in the epidemic if not carefully handled and in particular, there is growing fear that treatment may be bringing an adverse effect on the decline in prevalence rate as the treated, once they look healthier, they indulge once again, in unprotected sex.

(l) Indeed the now 18 year old insurgence and war in northern Uganda has made extension of HIV/AIDS services very difficult, making the region one of the most affected inspite reported declining prevalence rates in Uganda

Recent data shows that Kenya, Malawi and Zambia could be on a similar awareness track although prevalence rates have not followed the same trend as has been noted in Uganda [42].

2. The Impact of HIV/AIDS Africa

The impact of HIV/AIDS in Africa is noted in nearly all sectors of development. There is an obvious increase in total hospitalisation. The demand for care for those living with HIV/AIDS is tremendous. More health care workers are needed (in fact more than double the numbers before the epidemic), in a continent where there has originally been a shortage of trained health personnel.

AIDS does not only reverse the effort to reduce poverty but increases on the percentage of people living in extreme poverty because persons who get sick are usually those that contribute to the income, and when they get sick there is need to divert more income towards the illness, members divert more time and effort away from income-generating activities [5]. In a study

done in South Africa, already poor households coping with AIDS were reducing spending on basic necessities like clothes and food to divert resources towards the sick member of a family. There is evidence of reduced agricultural work in families affected by AIDS. The financial burden of death put on funerals is a major impact on most of the affected households.

Poorer households have removed the children from schools (especially girls). Often school fees, uniforms and books become unaffordable [13]. As parents and family members become ill, children take on more responsibilities to earn an income, produce food. Where both parents die of AIDS children become orphans and move to urban areas to become destitute. Children have become part of a generation to be raised by their grandparents.

Education Sector: A decline in school enrolment has been one of the most visible effects of the epidemic [17]: Reasons being removal of children from school to care for the sick parents and family members, inability to afford school fees and other expenses, decline in birth rates and fertility rates, more children are themselves infected and do not live longer to start school (see case studies on this in [4]). Teachers are infected with HIV/AIDS. Absenteeism is increased by HIV/AIDS as the illness causes intermittent periods of absence from class. Teachers with sick families take time off to attend funerals or to care for the dying relatives. Where this has been the case, classes have been combined to be taught by one teacher (hence increasing the pupil-teacher ratio), or even classes may be left untaught. The impact of this is largely felt in rural areas where there are few skilled teachers and replacement of such a teacher may take long.

HIV/AIDS dramatically affects labour, setting back economic activity and social progress. The vast numbers of people with HIV/AIDS in Africa are between ages 15 to 49 – in the prime of their working lives. Common of the problems associated with this are: absenteeism from work, productivity decline, health-care expenditures, new recruitment and training expenses. Funeral benefits and pension fund commitments are likely to rise due to unexpected early retirement and deaths (see case studies done in Kenya, South Africa, Swaziland [6],[10],[14],[37]). The fall in the economic growth in African economies is observed as a major impact of the epidemic. These countries were already struggling with development challenges, debt and declining trade before HIV/AIDS, and at the onset of the epidemic the meagre resource have to be turned to pay attention to the fight against HIV/AIDS

Government revenue and patterns of expenditure: A reduction in the rate of growth of the labour force, combined with falling productivity, means less government revenue from individuals and enterprises. As domestic and external savings fall, investment and physical capital may also decrease, unless an increase in foreign aid offsets the decrease in investment – an unlikely scenario in most sub-Saharan African countries, judging by recent trends. Analysis of the macro-economic impact of AIDS in Malawi and South Africa suggests that annual GDP growth rates may drop by 1-2 percentage points as a result of the epidemic [17]. This means that over time, if the trend continues, countries will be faced with the danger of macro-economic instability as the fiscal position deteriorates, with potential disruptive effects on economic and social relationships. This could have an adverse impact on confidence and, hence, investment.

As a consequence of declines in economic growth and productivity, the most seriously affected countries will find it difficult to improve or even maintain their position in the competitive hierarchy of international economies, at a time when faced with the challenge of rapid globalisation [10]. The implications of HIV/AIDS for GDP growth will clearly be substantial, both through the direct impact on labour supply, human capital and savings, as well as through a decline in total factor productivity. The prospect, then, for high-prevalence economies is: much lower GDP and employment growth rates, as already noted, and declines in output per head and average earnings. Moreover, poverty is likely to increase as a result of the impact of HIV/AIDS.

The epidemic creates a vicious cycle by reducing economic growth which leads to increased absolute poverty which, in turn, facilitates the rapid spread of AIDS as household expenditure on health and nutrition declines, thereby reducing resistance to opportunistic infections. In addition, the epidemic is likely to increase income inequality by increasing the supply price of scarce skilled labour, leading to higher wages for skilled workers vis-à-vis unskilled and unemployed labour.

On life Expectancy and population size: It is common knowledge that AIDS has considerably reduced average life expectancy in most of the countries especially Sub-Saharan countries [38]. Research shows that populations sizes of some countries may decrease even as much as 23% between 1992 and 2010 (for example Zimbabwe) [Poverty Reduction Forum; May 10, 2004]

3. Levels of involvement in the fight against HIV/AIDS in Africa

In order to have a significant fight against the spread of the epidemic, governments in Africa must adopt an approach involving all levels of leadership. The following are identified as focal points in this regard:

Personal Leadership: Every Individual must break the silence around the norms and practices that fuel HIV/AIDS pandemic; as a citizen, leader, wife, husband, child, youth, adult, worker, employer: everybody on his/her own must learn to speak openly, observe openly critical issues of information, attitudes and behaviour that must be known and followed about HIV/AIDS, take responsibility for avoiding risky sexual behaviour and by setting examples to their peers

Community Leadership: At the community, there should be a common struggle to overcome HIV/AIDS, in every family, village, township and settlement across Africa, resulting in a true local partnership. Empowerment should be at homes, workplaces, schools and communities to overcome denials, stigmatisation and discrimination. Orphanages should be a collective responsibility at both family and community (this is working in some village levels in Uganda) [45]. Community Leadership targets such as Spiritual Leaders, Traditional healers, Health care providers, women groups (are educators and role models for girls), teachers and educators, employers, elected and traditional leaders are accountable to their constituents and can play important roles in advocating for the community-wide campaigns

National Leadership: This, carefully done, creates the conditions for community mobilization across the nation. National leader example can transform the moral and social climate in which HIV/AIDS can be discussed and addressed openly, understanding the need to channel resources to the cause of the epidemic, involving sectoral approach to the fight against the disease (military, education, social, law, media).

Regional Leadership: Africa's HIV/AIDS pandemic knows no geographic, economic or social boundaries. It demands action at continental level and leadership. Our leaders can learn much from successful examples of fight against HIV/AIDS regionally. The regular sharing of experiences from elsewhere in Africa can be good tool for adopting best practices across the continent. Pan-African strategies on ARV drugs and treatment, mobilization through International partnership against AIDS in Africa, peace and inter-state policies are paramount.

International Leadership: International interest in global harmony can create commitment towards expedited HIV/AIDS grant procedures, reduced ARV drug prices, development of vaccine, research effort towards treatment of opportunistic infections, legal enactment of HIV/AIDS by-laws (international code of good practice on HIV/AIDS), and enforcement of transparency and accountability of funds purposely meant for HIV/AIDS programmes [6].

4. Challenges of Treatment in Africa

When ARVs were introduced in the early 1990s, they were hugely expensive. In 1998, the typical daily intake for an individual on ARVs was between six to fifteen pills a day. African countries, by no means, could not embrace the treatment concept at that time. The delay in having these drugs cheap continued to delay possible decline in deaths resulting from HIV/AIDS. High costs, a demanding treatment regime, and lack of even basic health infrastructure to deliver the treatment were cited as insurmountable barriers to providing treatment to Africans who needed it. Moreover, most of the regimes, even today demand an accompaniment of good, constant dietary, something that these poor families are not able to sustain. While prevention undoubtedly plays an important role in stemming the epidemic, supporting those already infected in living healthier, longer lives is crucial to minimize the impact of the epidemic; and indeed, the two need to advance in parallel. The main problems that arise in administering treatment protocols are:

(a) Sustainability of the regimes. Many families are poor. The drugs are taken at a monthly rate and sustaining the monthly cost can be afforded by very few.

(b) The Cost of the drugs: Whereas in the early 1990s the regime cost up to \$10,000 it has now come down to an average of \$200. This is still extremely unaffordable by Africa [6].

The current international negotiations with pharmaceutical companies to have low cost regimes and the increased international and government subsidies on these drugs need to be sped-up.

5. Scaling up the Response to HIV/AIDS

As mentioned earlier, the best way forward for Africa to fight the scourge is to develop a multisectoral approach. Currently, the impact on the epidemic in many countries is comprised of fragmentation. Different actors are pursuing HIV/AIDS agendas in isolation from each other. Instead of working within nationally negotiated and agreed strategic agendas, actors- whether government or non-government, UN or private sector, have tended to address HIV/AIDS as an area for designing and implementing multiple, often small scale projects within their own objectives, management, monitoring and evaluation systems. Governments should let all those stakeholders willing and able to help at local levels be involved as part of their duties. Indeed several governments (South Africa, Tanzania, Malawi, Swaziland) have already started taking bold and innovative steps in this direction. The key elements to adopt in multisectoral approach are summarized in the following points [39],[44].

There is need for high-level political support and decentralized planning and implementation for behaviour change communication that needs to reach the general population and key target. An example of this is the National AIDS Control Programme (ACP) of Uganda that was established in 1996, which launched an aggressive public media campaign that included printing media material, radios, billboards and community mobilization for grass-root offensive against HIV [39]. Interventions that address women and youth stigma and discrimination are essential. Involving religious leaders and faith-based organizations at the front is good since they always have big populations to interact with. Confidential Voluntary Counselling and Testing (VCT) was very useful in Uganda. In Uganda, the first AIDS Information Centre (AIC) was opened in 1990 with an aim of anonymous VCT and since then has spread to major townships in the country. People got excited with knowing their sero-status. Those who found themselves HIV-negative improved on their behaviour and those who found themselves positive immediately started ARVs than waiting to start on them too late. This was extremely useful. AIC pioneered

“same day results” using rapid HIV tests to cope with the growing number of clients interested in knowing their sero-status, as well as “Post Test Clubs” to provide long term support for behaviour change to anyone who has been tested, regardless of the sero-status [39].

Condom marketing and promotion, sexually transmitted infections (STIs) control and prevention programmes and programmes aimed at discouraging multiple sexual partners have also shown effectiveness once used appropriately.

6. HIV/AIDS Research and Scientific Trends in Africa

In the last two decades since the first cases of AIDS were identified, HIV/AIDS has emerged as one of the leading challenges for global public health. To plan and evaluate control strategies effectively, treatment evaluations and for vaccine trials, it is critical to estimate the magnitude and projection of the HIV/AIDS epidemic. Population-based epidemiological data for most of the African region is very limited because of the nature of the disease. As mentioned at the beginning of this paper, traditionally and culturally people in Africa do not speak about their sexual practices (how many partners one has, how frequent they have sex, whether they use condom, how many children do they have). This makes it difficult to obtain demographic and parameter values while modelling the dynamics of the epidemic.

Mathematical modelling has been used as a tool to project demographic, economic and social impact in Africa, based on earlier models [19], [28], [43]. Other models have been designed targeting preventive measures [18],[24],[25],[26],[27],[28]. A dynamic compartmental simulation model to identify the best strategies for preventing spread of HIV/AIDS was described for Botswana and India [31].

Extension of previous mathematical models that were developed to estimate epidemic trends based on sentinel surveillance data from pregnant women using sub-Saharan Africa was done in [35] to improve the methodological basis for modelling the HIV/AIDS. The study presented a method for modifying current models of the HIV epidemics to take advantage of all available data and reflect the uncertainty in estimates produced by fitting models to a small number of data points.

There is a new initiative to build capacity across Africa to collect data and conduct quantitative analyses necessary to understand the dynamics of major diseases afflicting the continent, with an initial emphasis on HIV/AIDS [11]. In the proposal it is noted that the most important ingredient in the detailed mathematical and statistical analyses of Host-pathogen interactions, is the skill required to build dynamical systems and statistical models then used to derive the necessary insights.

More recent research is focusing on the modelling the within-host dynamics of HIV/AIDS in preparation for the anticipated break-through in vaccine trials and development.

7. New Challenges:

(a) The Problem of Complacency

Complacency about the need for HIV prevention may be among the strongest barriers communities face as they plan to meet the next century's prevention needs. The great success that many people, but not all, have had with new highly active antiretroviral therapies (HAART, also known as drug "cocktails") and the resulting decline in the number of newly reported AIDS cases and deaths are indeed good news. The underlying reality, however, is that the HIV

epidemic in most of the countries is far from over. This is true not only for the nation, but for the continuing number of HIV-infected individuals who now must face years, perhaps a lifetime of multiple daily medications, possible unpleasant or severe side effects, and great expense associated with the medicines needed to suppress HIV and prevent opportunistic infections.

The success of HAART is good news for the people living longer, better lives because of it, but the availability of treatment may lull people into believing that preventing HIV infection is no longer important. This complacency about the need for prevention adds a new dimension of complexity for both program planners and individuals at risk.

While the number of AIDS cases is declining, the number of people *living* with HIV infection is growing. This increased prevalence of HIV in the population means that even more prevention efforts are needed, not fewer. For individuals at risk, increased prevalence means that each risk behaviour carries an increased risk for infection. This makes the danger of relaxing preventive behaviours greater than ever.

Past prevention efforts have resulted in behaviour change for many individuals and have helped to slow the epidemic overall. However, many studies find that high-risk behaviours, especially unprotected sex, are continuing at far too high a rate. This is true even for some people who have been counselled and tested for HIV, including those found to be infected [43].

(b) Re-emerging of Resistant Strains

The prolonged use ARVs is not only looked at a wonderful tool in making the HIV infected persons live longer. Yes, it is true when they live longer they come back to good useful life, bring happiness to the families. Although treatments that combine new protease inhibitor drugs with other anti- HIV medications often effectively suppress HIV production in infected individuals, results from recent clinical studies suggest that many treatment failures occur due to the development of resistance by the virus [1], [32], [33]. Today there is an eminent problem of re-emerging of more resistant HIV strain when the HIV/AIDS patients on ARVs engage in unprotected sex [36].

Drug-resistant HIV strains are threatening to undo the benefits of ARVs offered to patients. Resistant strains have been reported from the world over, including India. Till now, anti-retrovirals were considered to have revolutionised care of those living with HIV. Earlier patients were put on anti-retrovirals at an early stage. Experts now advise cautious use of these drugs to ensure that replicating virus does not become drug resistant. Otherwise, it creates the same situation as the misuse of antibiotics does ([8], [34]).

(c) HIV/AIDS Vaccine

A few vaccine development efforts are being prepared in Africa, and these need to be promoted and reinforced. Dr William Malegapuru Makgoba, President of the Medical Research Council of South Africa, spearheaded the South African AIDS Vaccine Initiative (SAAVI). Several African countries have participated in international projects, including other HIV prevention trials, but infrastructures and capabilities to conduct vaccine trials are virtually non-existent in Africa. Vaccine trials in Africa have been carried on in countries like Uganda, Kenya, Botswana, and South Africa; with Malawi, Tanzania, Rwanda, Nigeria, and Senegal as countries preparing to start the trials [15]. The main obstacles that tend to hinder the completion of these trials include: social, political, legal and ethical barriers, manifesting themselves in widespread public and media fears about the risks of taking part in the trial, including the risks of becoming infected and being experimented on [16], [22], [30]. There are also a number of cultural factors that need

to be considered when carrying out research in Africa and elsewhere. For example, in some patriarchal societies women may not be able to give consent easily without the consent of their husbands [21].

All the same, with hardships of limited laboratory facilities and funds to carry out consistent research in vaccine development in Africa, there is good will and anticipation from many stakeholders. The **following paragraphs give summarized concern, conviction, desire and pledge of African countries towards urgent need of joint involvement of all scientists in the search for HIV/AIDS vaccine. The appeal is as contained in the popular Nairobi Declaration, June 2000. The Appeal reads as follows:**

We, the participants gathered in Nairobi, Kenya from 12 to 14 June 2000, on the occasion of a consultation organised under the auspices of the World Health Organisation (WHO), the Joint United Nations Programme on HIV/AIDS (UNAIDS), the Southern African Development Community (SADC), the Society on AIDS in Africa (SAA) and the African Council of AIDS Service Organisation (AfriCASO) to discuss ways to accelerate the development and future availability of HIV vaccines for Africa:

***Appeal** to African HIV/AIDS scientists to develop and strengthen existing regional networks for AIDS research consistent with the need to facilitate exchange of information and experience relative to various aspects of HIV vaccine research. In addition, mechanisms to promote the development of appropriate candidate vaccines and to conduct scientifically and ethically sound clinical trials must be developed.*

***Urge** that industrialised countries and international HIV/AIDS aid and research agencies scale up their technical and financial support to HIV vaccine development efforts for Africa, commensurate with the magnitude and urgency of the HIV/AIDS crisis on the African continent, paying particular attention to the variability of the HIV strains between different regions of the world.*

Other similar efforts to mobilize scientists to map up a strategy for HIV/AIDS vaccine for Africa are contained in a **Durban, South Africa, 13 July 2000, XIII International Conference on AIDS meeting where** leading scientists in Africa met to throw their weight behind the development of HIV vaccines for Africa by calling upon African governments, regional and international agencies, industry and donors to speed up research and testing. At this meeting new *African Strategy for an HIV Vaccine*, was unveiled with hopes to fast-track HIV vaccine development in Africa to achieve results in the shortest possible time. The Botswana Think Tanks Symposium (2004) [15] also widely received and discussed a lot scientific implications on the updates for the vaccine trials in Africa.

8. Conclusion

Much greater numbers of people who acquired HIV over the past years are becoming ill - it takes up to 10 years from infection to illness, so AIDS in Africa is often hidden. In the absence of massively expanded prevention efforts, the AIDS in Africa death toll will continue rising for another decade. The worst of the AIDS in Africa impact will be felt in the next decade and beyond. It is not too late to introduce measures to reduce that impact, including wider access to HIV medicines and help for the poor.

Every country has its own future when it comes to AIDS, but when it comes to Africa, the focus towards successful fight against HIV/AIDS requires a concerted effort. The poverty that engulfs most of the African countries, the problems of unstable governance, the wars that have become a common phenomenon across the continent over the past decade (the case of Uganda, DR Congo, Rwanda, The Sudan, Ethiopia, Eritrea, Somalia, Liberia, Ivory Coast, to single out a few nations), unemployment, rural-urban migration, cheap seasonal labour, traditional and cultural beliefs all need to be addressed across the continent while addressing the issue of the pandemic.

Now with overstretched resources, economies of Africa need heavy international partnership to enable them be part of the global efforts to fight AIDS. African Scientists must form research collaborations with the rest of the world towards HIV vaccine development so that African peoples can see themselves as belong to, than waiting for success.

Reference

- [1] Antimicrobial Resistance, NIAID Fact Sheet, (2000). National Institute of Allergy and Infectious Diseases
- [2] Asamoah-Odei, E. J., Garcia-Calleja, J.M. & Boerma, J.T. (2004). HIV Prevalence and Trends in Sub-Saharan Africa: no decline and large subregional differences. *Lancet*, **364**:35-40
- [3] The ABC of HIV Prevention: Report of the USAID Technical Meeting on Behaviour Change Approaches to Primary Prevention of HIV/AIDS, September 17, 2002
- [4] AllAfrica.com (2004). AIDS is damaging education system-Mocumpi, May Issue
- [5] Bechu, N. (1998). The Impact of AIDS on the economy of Families in Cote d'Ivoire: Changes in consumption among AIDS-affected households. In: M. Ainsworth, L. Fransen and M. Over (eds). *Confronting AIDS: Evidence from developing world: Selected background papers for the World Bank Policy Research Report*. Brussels, European Commission
- [6] Bollinger, L. & Stover, J. (1999). The Economic Impact of AIDS. Glastonbury CT: Futures Group International
- [7] Cleland J.G., Ali, M.M. and Capo-Chichi, V. (1999). Postpartum sexual abstinence in West Africa: implications for AIDS-control and family planning programmes. *AIDS*, **13** (1): 125-131.
- [8] Condra, J.H. (1995). In vivo emergence of HIV-1 variants resistant to multiple protease inhibitors. *Nature*, **374**:569-571.
- [9] Donadje F. and D. Tabutin 1994. Male nuptiality and fertility in Southern Benin. In: T. Locoh and V. Hertrick (eds). *The onset of fertility transition in sub-Saharan Africa*. Ordina-IUSSP, Liege.
- [10] Dixon, S., McDonald, S. and Roberts, J. (2002). The Impact of HIV and AIDS on Africa's Economic development. *BMJ*, **324**: 232-4
- [11] Getz, W.M., Gouws, E., Hahne, F., Ekkehard kopp, P., Mostert, P., Muller, C., Seioghe, C., Williams, B. and Witten, G. (2003). Mathematical models and the fight against diseases in Africa. *South African Journal of Science*, **99**: 1 - 2

- [12] Gregson S., Zhuwau, T., Anderson, R.M. and Chandiwana, S.K. (1997). HIV and fertility change in rural Zimbabwe. *Health Transition Review*, **7**(2): 89-112.
- [13] Henry, J. Kaiser Family Foundatioin and Health Systems Trust (2000). Hittinh Home: How households cope with the impact of the HIVAIDS epidemic. October report
- [14] Haacker, M. (2002). The Economic Consequences of HIV/AIDS in Southern Africa. IMF working paper. Washington. WP/02/38
- [15] HIV Vaccine for Developing Countries: Initiation of vaccine trials in Africa. The XI Think Tank Symposium of the Harvard AIDS Institute Series on Vaccine Solutions for Developing Countries, April 29 – May 1, 2004, Gaborone, Botswana
- [16] Hom, D.L., Johnson, J.L., Mugenyi, P., Byaruhanga, R., Kityo, C. and Loughlin A, (1997). HIV-1 risk and vaccine acceptability in the Ugandan Military. *J Acquir Immune Def Synd Hum Retrovir* **15**: 375-380.
- [17] Cuddington, J.C. and Hancock, J.D. (1995). The macro-economic impact of AIDS in Malawi. *Journal of African Economics*, **1**: 1-28.
- [18] Luboobi, L.S. (1994). A Three Age-Groups for the epidemic and the effect of Medical/Social Intervention. *Math. Comp. Modelling* **19**(9): 91 – 105
- [19] Luboobi, L.S. (1991). Mathematical Models for the dynamics of HIV/AIDS Epidemic. In: M.S. Patel & S. Nokoe (eds). *Biometry for Development*. ICPE, Scientific Press, Nairobi, 71 – 83
- [20] Mbulaiteye, S.M., Mahe, J.A.G. and Whitworth, S. (2002). Declining HIV-1 incidence and associated over 10 years in a rural population in south-west Uganda: A cohort study. *Lancet*, **360**: 41-44
- [21] Makgoba, M.W., Solomon, N. and Tucker, T.J.P. (2002). The search for an HIV vaccine. *BMJ*, **324**:211-213.
- [22] Mugerwa RD, Kaleebu P, Mugenyi P. (2002). First trial of the HIV-1 vaccine in Africa, Ugandan experience. *BMJ*, **324**:226-229.
- [23] Mugerwa, R.D. and Ellner, J. (1997). A Phase I Study of the safety and Immunogenicity of live recombinant ALVAC-HIVvCP205 in HIV-1 uninfected adult Volunteers in Uganda. *HIVNET protocol 007, Version 1.0*
- [24] Mugisha, J.Y.T. and L. S. Luboobi (2003) Modelling the Effect of Vertical Transmission in the Dynamics of HIV/AIDS in an Age-structured Population. *S. Pac. J. Nat. Sci.* **21**: 82 - 90.
- [25] Mugisha, J.Y.T. and Luboobi, L.S. (2002). The Effect of Treatment of HIV/AIDS patient in a Two-Age Groups Population. *SAMSA Journal* **2**: 106 – 130.
- [26] Mugisha, J.Y.T. and Luboobi, L.S. (2000). The Endemicity of HIV/AIDS in a Three-Age Structured Population. *Intern. J. Mgt & Syst.* **16**(2): 126-136.

- [27] Mugisha, J.Y.T. and Luboobi, L.S. (2000). The Effect of Vaccinating Susceptible Adults against HIV/AIDS in a Two-Age Groups Population. *Zim. J. Sc. Tech.* **1**(2): 91 - 103.
- [28] Mugisha, J.Y.T. (1999). *Mathematical Models for the Spread of HIV/AIDS Pandemic in (Age-) Structured Populations*. PhD Dissertation, Department of Mathematics, Makerere University
- [29] Mugisha, J,Y,T, (1992). *Mathematical Models for the Dynamics of HIV/AIDS Epiemic for a Three-Age Groups Population*. MSc Dissertation, Department of Mathematics, Makerere University
- [30] McGrath, J.W., George, K., Svilar, G., Ihler, E., Mafigiri, D. and Kabugo, M. (2001). Developing AIDS vaccine trials education programs in Uganda. *J Acquir Immune Def Synd Hum Retrovir.* **26**: 176-181.
- [31] Nagelkerke, N.J.D., Prabhat, V.L.A.S., Sake, J., de, Korenkomp, E.L., Moses, S., Blanchard, J.F. and Plummer, F.A. (2002). Modelling HIV/AIDS epidemics in Botswana and India: impact of interventions to prevent transmission. *Bulletin of the World Health Organization*; **80**(2):89-96.
- [32] Paterson, D.L. (2000). Adherence to protease inhibitor therapy and outcomes in patients with HIV infection. *Annals of Internal Medicine* **133**: 21-30.
- [33] Phillips, A.N. (1999). Low and decreasing rate of viral rebound with prolonged viral suppression on HAART: insights into long-term impact of resistance. *Antiviral Therapy*, **4**(1):120.
- [34] Phillips AN (2004). Risk of development of drug resistance in patients starting antiretroviral therapy with three or more drugs in routine clinical practice. *AntiviralTherapy***9**:S151
- [35] Salomon, J.A. and Murray, C.J.L. (2001). Modeling HIV/AIDS epidemics in sub-Saharan Africa using seroprevalence data from antenatal clinics. *Bulletin of the World Health Organization*, **79**(7):596-607.
- [36] Soderborg, K. (1999). Detection of drug resistance mutations in HIV-1 patients with early viral rebound during an on-going combination therapy programme. *Antiviral Therapy*,**4**(1):80
- [37] Rosen, S. (2004). The cost of HIV/AIDS to business in Southern Africa. *AIDS*, **18**: 317-324
- [38] Stanecki, K.A. (2002). The AIDS Pandemic in the 21st Century. Draft report, July 2002, XIV International Conference on AIDS, Barcelona
- [39] Stover, J. (2002). The effects of behaviour change on trends in hIV incidence in Uganda and Kenya. Presentation to USAID, Washindton Feb 5 2002
- [40] The Botusa Project-A collaboration of the Botswana Government and the US Centers for Desease Control and Prevention, www.cdc.gov/nchstp/od/gap/countries/botswana.htm Accessed: 29/03/05

- [41] The World Bank (2002). Education and HIV/AIDS: A window of Hope.
- [42] UNAIDS/WHO Epidemiological Fact Sheet 2004 Update, Zambia
- [43] Valdiserri, R.O. (2004). Mapping the Roots of HIV/AIDS Complacency: Implications for Program and Policy Development. *Aids Education & Prevention*, **16**(5): 426 – 439
- [44] www.africaaction.org/docs03/tac0303.htm Accessed 29/03/05
- [45] www.aidsuganda.org Accessed 29/03/05
- [46] Wanetosi, E.M. (1989). *Mathematical Models for the Dynamics of the AIDS/Slim Epidemic in Uganda*. MSc Dissertation, Department of Mathematics, Makerere University

NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI

Fondazione Eni Enrico Mattei Working Paper Series

Our Note di Lavoro are available on the Internet at the following addresses:

<http://www.feem.it/Feem/Pub/Publications/WPapers/default.html>

<http://www.ssrn.com/link/feem.html>

<http://www.repec.org>

NOTE DI LAVORO PUBLISHED IN 2004

IEM	1.2004	Anil MARKANDYA, Suzette PEDROSO and Alexander GOLUB: <u>Empirical Analysis of National Income and So2 Emissions in Selected European Countries</u>
ETA	2.2004	Masahisa FUJITA and Shlomo WEBER: <u>Strategic Immigration Policies and Welfare in Heterogeneous Countries</u>
PRA	3.2004	Adolfo DI CARLUCCIO, Giovanni FERRI, Cecilia FRALE and Ottavio RICCHI: <u>Do Privatizations Boost Household Shareholding? Evidence from Italy</u>
ETA	4.2004	Victor GINSBURGH and Shlomo WEBER: <u>Languages Disenfranchisement in the European Union</u>
ETA	5.2004	Romano PIRAS: <u>Growth, Congestion of Public Goods, and Second-Best Optimal Policy</u>
CCMP	6.2004	Herman R.J. VOLLEBERGH: <u>Lessons from the Polder: Is Dutch CO2-Taxation Optimal</u>
PRA	7.2004	Sandro BRUSCO, Giuseppe LOPOMO and S. VISWANATHAN (lxv): <u>Merger Mechanisms</u>
PRA	8.2004	Wolfgang AUSENNEGG, Pegaret PICHLER and Alex STOMPER (lxv): <u>IPO Pricing with Bookbuilding, and a When-Issued Market</u>
PRA	9.2004	Pegaret PICHLER and Alex STOMPER (lxv): <u>Primary Market Design: Direct Mechanisms and Markets</u>
PRA	10.2004	Florian ENGLMAIER, Pablo GUILLEN, Loreto LLORENTE, Sander ONDERSTAL and Rupert SAUSGRUBER (lxv): <u>The Chopstick Auction: A Study of the Exposure Problem in Multi-Unit Auctions</u>
PRA	11.2004	Bjarne BRENDSTRUP and Harry J. PAARSCH (lxv): <u>Nonparametric Identification and Estimation of Multi-Unit, Sequential, Oral, Ascending-Price Auctions With Asymmetric Bidders</u>
PRA	12.2004	Ohad KADAN (lxv): <u>Equilibrium in the Two Player, k-Double Auction with Affiliated Private Values</u>
PRA	13.2004	Maarten C.W. JANSSEN (lxv): <u>Auctions as Coordination Devices</u>
PRA	14.2004	Gadi FIBICH, Arie GAVIOUS and Aner SELA (lxv): <u>All-Pay Auctions with Weakly Risk-Averse Buyers</u>
PRA	15.2004	Orly SADE, Charles SCHNITZLEIN and Jaime F. ZENDER (lxv): <u>Competition and Cooperation in Divisible Good Auctions: An Experimental Examination</u>
PRA	16.2004	Marta STRYSZOWSKA (lxv): <u>Late and Multiple Bidding in Competing Second Price Internet Auctions</u>
CCMP	17.2004	Slim Ben YOUSSEF: <u>R&D in Cleaner Technology and International Trade</u>
NRM	18.2004	Angelo ANTOCI, Simone BORGHESI and Paolo RUSSU (lxvi): <u>Biodiversity and Economic Growth: Stabilization Versus Preservation of the Ecological Dynamics</u>
SIEV	19.2004	Anna ALBERINI, Paolo ROSATO, Alberto LONGO and Valentina ZANATTA: <u>Information and Willingness to Pay in a Contingent Valuation Study: The Value of S. Erasmo in the Lagoon of Venice</u>
NRM	20.2004	Guido CANDELA and Roberto CELLINI (lxvii): <u>Investment in Tourism Market: A Dynamic Model of Differentiated Oligopoly</u>
NRM	21.2004	Jacqueline M. HAMILTON (lxvii): <u>Climate and the Destination Choice of German Tourists</u>
NRM	22.2004	Javier Rey-MAQUIEIRA PALMER, Javier LOZANO IBÁÑEZ and Carlos Mario GÓMEZ GÓMEZ (lxvii): <u>Land, Environmental Externalities and Tourism Development</u>
NRM	23.2004	Pius ODUNGA and Henk FOLMER (lxvii): <u>Profiling Tourists for Balanced Utilization of Tourism-Based Resources in Kenya</u>
NRM	24.2004	Jean-Jacques NOWAK, Mondher SAHLI and Pasquale M. SGRO (lxvii): <u>Tourism, Trade and Domestic Welfare</u>
NRM	25.2004	Riaz SHAREEF (lxvii): <u>Country Risk Ratings of Small Island Tourism Economies</u>
NRM	26.2004	Juan Luis EUGENIO-MARTÍN, Noelia MARTÍN MORALES and Riccardo SCARPA (lxvii): <u>Tourism and Economic Growth in Latin American Countries: A Panel Data Approach</u>
NRM	27.2004	Raúl Hernández MARTÍN (lxvii): <u>Impact of Tourism Consumption on GDP. The Role of Imports</u>
CSRM	28.2004	Nicoletta FERRO: <u>Cross-Country Ethical Dilemmas in Business: A Descriptive Framework</u>
NRM	29.2004	Marian WEBER (lxvi): <u>Assessing the Effectiveness of Tradable Landuse Rights for Biodiversity Conservation: an Application to Canada's Boreal Mixedwood Forest</u>
NRM	30.2004	Trond BJORN DAL, Phoebe KOUNDOURI and Sean PASCOE (lxvi): <u>Output Substitution in Multi-Species Trawl Fisheries: Implications for Quota Setting</u>
CCMP	31.2004	Marzio GALEOTTI, Alessandra GORIA, Paolo MOMBRINI and Evi SPANTIDAKI: <u>Weather Impacts on Natural, Social and Economic Systems (WISE) Part I: Sectoral Analysis of Climate Impacts in Italy</u>
CCMP	32.2004	Marzio GALEOTTI, Alessandra GORIA, Paolo MOMBRINI and Evi SPANTIDAKI: <u>Weather Impacts on Natural, Social and Economic Systems (WISE) Part II: Individual Perception of Climate Extremes in Italy</u>
CTN	33.2004	Wilson PEREZ: <u>Divide and Conquer: Noisy Communication in Networks, Power, and Wealth Distribution</u>
KTHC	34.2004	Gianmarco I.P. OTTAVIANO and Giovanni PERI (lxviii): <u>The Economic Value of Cultural Diversity: Evidence from US Cities</u>
KTHC	35.2004	Linda CHAIB (lxviii): <u>Immigration and Local Urban Participatory Democracy: A Boston-Paris Comparison</u>

KTHC	36.2004	<i>Franca ECKERT COEN and Claudio ROSSI</i> (lxviii): <u>Foreigners, Immigrants, Host Cities: The Policies of Multi-Ethnicity in Rome. Reading Governance in a Local Context</u>
KTHC	37.2004	<i>Kristine CRANE</i> (lxviii): <u>Governing Migration: Immigrant Groups' Strategies in Three Italian Cities – Rome, Naples and Bari</u>
KTHC	38.2004	<i>Kiflemariam HAMDE</i> (lxviii): <u>Mind in Africa, Body in Europe: The Struggle for Maintaining and Transforming Cultural Identity - A Note from the Experience of Eritrean Immigrants in Stockholm</u>
ETA	39.2004	<i>Alberto CAVALIERE</i> : <u>Price Competition with Information Disparities in a Vertically Differentiated Duopoly</u>
PRA	40.2004	<i>Andrea BIGANO and Stef PROOST</i> : <u>The Opening of the European Electricity Market and Environmental Policy: Does the Degree of Competition Matter?</u>
CCMP	41.2004	<i>Micheal FINUS</i> (lxix): <u>International Cooperation to Resolve International Pollution Problems</u>
KTHC	42.2004	<i>Francesco CRESPI</i> : <u>Notes on the Determinants of Innovation: A Multi-Perspective Analysis</u>
CTN	43.2004	<i>Sergio CURRARINI and Marco MARINI</i> : <u>Coalition Formation in Games without Synergies</u>
CTN	44.2004	<i>Marc ESCRIHUELA-VILLAR</i> : <u>Cartel Sustainability and Cartel Stability</u>
NRM	45.2004	<i>Sebastian BERVOETS and Nicolas GRAVEL</i> (lxvi): <u>Appraising Diversity with an Ordinal Notion of Similarity: An Axiomatic Approach</u>
NRM	46.2004	<i>Signe ANTHON and Bo JELLES MARK THORSEN</i> (lxvi): <u>Optimal Afforestation Contracts with Asymmetric Information on Private Environmental Benefits</u>
NRM	47.2004	<i>John MBURU</i> (lxvi): <u>Wildlife Conservation and Management in Kenya: Towards a Co-management Approach</u>
NRM	48.2004	<i>Ekin BIROL, Ágnes GYÓVAI and Melinda SMALE</i> (lxvi): <u>Using a Choice Experiment to Value Agricultural Biodiversity on Hungarian Small Farms: Agri-Environmental Policies in a Transition al Economy</u>
CCMP	49.2004	<i>Gernot KLEPPER and Sonja PETERSON</i> : <u>The EU Emissions Trading Scheme. Allowance Prices, Trade Flows, Competitiveness Effects</u>
GG	50.2004	<i>Scott BARRETT and Michael HOEL</i> : <u>Optimal Disease Eradication</u>
CTN	51.2004	<i>Dinko DIMITROV, Peter BORM, Ruud HENDRICKX and Shao CHIN SUNG</i> : <u>Simple Priorities and Core Stability in Hedonic Games</u>
SIEV	52.2004	<i>Francesco RICCI</i> : <u>Channels of Transmission of Environmental Policy to Economic Growth: A Survey of the Theory</u>
SIEV	53.2004	<i>Anna ALBERINI, Maureen CROPPER, Alan KRUPNICK and Nathalie B. SIMON</i> : <u>Willingness to Pay for Mortality Risk Reductions: Does Latency Matter?</u>
NRM	54.2004	<i>Ingo BRÄUER and Rainer MARGGRAF</i> (lxvi): <u>Valuation of Ecosystem Services Provided by Biodiversity Conservation: An Integrated Hydrological and Economic Model to Value the Enhanced Nitrogen Retention in Renaturated Streams</u>
NRM	55.2004	<i>Timo GOESCHL and Tun LIN</i> (lxvi): <u>Biodiversity Conservation on Private Lands: Information Problems and Regulatory Choices</u>
NRM	56.2004	<i>Tom DEDEURWAERDERE</i> (lxvi): <u>Bioprospection: From the Economics of Contracts to Reflexive Governance</u>
CCMP	57.2004	<i>Katrin REHDANZ and David MADDISON</i> : <u>The Amenity Value of Climate to German Households</u>
CCMP	58.2004	<i>Koen SMEKENS and Bob VAN DER ZWAAN</i> : <u>Environmental Externalities of Geological Carbon Sequestration Effects on Energy Scenarios</u>
NRM	59.2004	<i>Valentina BOSETTI, Mariaester CASSINELLI and Alessandro LANZA</i> (lxvii): <u>Using Data Envelopment Analysis to Evaluate Environmentally Conscious Tourism Management</u>
NRM	60.2004	<i>Timo GOESCHL and Danilo CAMARGO IGLIORI</i> (lxvi): <u>Property Rights Conservation and Development: An Analysis of Extractive Reserves in the Brazilian Amazon</u>
CCMP	61.2004	<i>Barbara BUCHNER and Carlo CARRARO</i> : <u>Economic and Environmental Effectiveness of a Technology-based Climate Protocol</u>
NRM	62.2004	<i>Elissaios PAPYRAKIS and Reyer GERLAGH</i> : <u>Resource-Abundance and Economic Growth in the U.S.</u>
NRM	63.2004	<i>Györgyi BELA, György PATAKI, Melinda SMALE and Mariann HAJDÚ</i> (lxvi): <u>Conserving Crop Genetic Resources on Smallholder Farms in Hungary: Institutional Analysis</u>
NRM	64.2004	<i>E.C.M. RUIJGROK and E.E.M. NILLESEN</i> (lxvi): <u>The Socio-Economic Value of Natural Riverbanks in the Netherlands</u>
NRM	65.2004	<i>E.C.M. RUIJGROK</i> (lxvi): <u>Reducing Acidification: The Benefits of Increased Nature Quality. Investigating the Possibilities of the Contingent Valuation Method</u>
ETA	66.2004	<i>Giannis VARDAS and Anastasios XEPAPADEAS</i> : <u>Uncertainty Aversion, Robust Control and Asset Holdings</u>
GG	67.2004	<i>Anastasios XEPAPADEAS and Constadina PASSA</i> : <u>Participation in and Compliance with Public Voluntary Environmental Programs: An Evolutionary Approach</u>
GG	68.2004	<i>Michael FINUS</i> : <u>Modesty Pays: Sometimes!</u>
NRM	69.2004	<i>Trond BJØRNDAL and Ana BRASÃO</i> : <u>The Northern Atlantic Bluefin Tuna Fisheries: Management and Policy Implications</u>
CTN	70.2004	<i>Alejandro CAPARRÓS, Abdelhakim HAMMOUDI and Tarik TAZDAÏT</i> : <u>On Coalition Formation with Heterogeneous Agents</u>
IEM	71.2004	<i>Massimo GIOVANNINI, Margherita GRASSO, Alessandro LANZA and Matteo MANERA</i> : <u>Conditional Correlations in the Returns on Oil Companies Stock Prices and Their Determinants</u>
IEM	72.2004	<i>Alessandro LANZA, Matteo MANERA and Michael MCALEER</i> : <u>Modelling Dynamic Conditional Correlations in WTI Oil Forward and Futures Returns</u>
SIEV	73.2004	<i>Margarita GENIUS and Elisabetta STRAZZERA</i> : <u>The Copula Approach to Sample Selection Modelling: An Application to the Recreational Value of Forests</u>

CCMP	74.2004	<i>Rob DELLINK and Ekko van IERLAND</i> : <u>Pollution Abatement in the Netherlands: A Dynamic Applied General Equilibrium Assessment</u>
ETA	75.2004	<i>Rosella LEVAGGI and Michele MORETTO</i> : <u>Investment in Hospital Care Technology under Different Purchasing Rules: A Real Option Approach</u>
CTN	76.2004	<i>Salvador BARBERÀ and Matthew O. JACKSON (lxx)</i> : <u>On the Weights of Nations: Assigning Voting Weights in a Heterogeneous Union</u>
CTN	77.2004	<i>Àlex ARENAS, Antonio CABRALES, Albert DÍAZ-GUILERA, Roger GUIMERÀ and Fernando VEGA-REDONDO (lxx)</i> : <u>Optimal Information Transmission in Organizations: Search and Congestion</u>
CTN	78.2004	<i>Francis BLOCH and Armando GOMES (lxx)</i> : <u>Contracting with Externalities and Outside Options</u>
CTN	79.2004	<i>Rabah AMIR, Effrosyni DIAMANTOUDI and Licun XUE (lxx)</i> : <u>Merger Performance under Uncertain Efficiency Gains</u>
CTN	80.2004	<i>Francis BLOCH and Matthew O. JACKSON (lxx)</i> : <u>The Formation of Networks with Transfers among Players</u>
CTN	81.2004	<i>Daniel DIERMEIER, Hülya ERASLAN and Antonio MERLO (lxx)</i> : <u>Bicameralism and Government Formation</u>
CTN	82.2004	<i>Rod GARRATT, James E. PARCO, Cheng-ZHONG QIN and Amnon RAPOPORT (lxx)</i> : <u>Potential Maximization and Coalition Government Formation</u>
CTN	83.2004	<i>Kfir ELIAZ, Debraj RAY and Ronny RAZIN (lxx)</i> : <u>Group Decision-Making in the Shadow of Disagreement</u>
CTN	84.2004	<i>Sanjeev GOYAL, Marco van der LEIJ and José Luis MORAGA-GONZÁLEZ (lxx)</i> : <u>Economics: An Emerging Small World?</u>
CTN	85.2004	<i>Edward CARTWRIGHT (lxx)</i> : <u>Learning to Play Approximate Nash Equilibria in Games with Many Players</u>
IEM	86.2004	<i>Finn R. FØRSUND and Michael HOEL</i> : <u>Properties of a Non-Competitive Electricity Market Dominated by Hydroelectric Power</u>
KTHC	87.2004	<i>Elissaios PAPYRAKIS and Reyer GERLAGH</i> : <u>Natural Resources, Investment and Long-Term Income</u>
CCMP	88.2004	<i>Marzio GALEOTTI and Claudia KEMFERT</i> : <u>Interactions between Climate and Trade Policies: A Survey</u>
IEM	89.2004	<i>A. MARKANDYA, S. PEDROSO and D. STREIMIKIENE</i> : <u>Energy Efficiency in Transition Economies: Is There Convergence Towards the EU Average?</u>
GG	90.2004	<i>Rolf GOLOMBEK and Michael HOEL</i> : <u>Climate Agreements and Technology Policy</u>
PRA	91.2004	<i>Sergei IZMALKOV (lxv)</i> : <u>Multi-Unit Open Ascending Price Efficient Auction</u>
KTHC	92.2004	<i>Gianmarco I.P. OTTAVIANO and Giovanni PERI</i> : <u>Cities and Cultures</u>
KTHC	93.2004	<i>Massimo DEL GATTO</i> : <u>Agglomeration, Integration, and Territorial Authority Scale in a System of Trading Cities. Centralisation versus devolution</u>
CCMP	94.2004	<i>Pierre-André JOUVET, Philippe MICHEL and Gilles ROTILLON</i> : <u>Equilibrium with a Market of Permits</u>
CCMP	95.2004	<i>Bob van der ZWAAN and Reyer GERLAGH</i> : <u>Climate Uncertainty and the Necessity to Transform Global Energy Supply</u>
CCMP	96.2004	<i>Francesco BOSELLO, Marco LAZZARIN, Roberto ROSON and Richard S.J. TOL</i> : <u>Economy-Wide Estimates of the Implications of Climate Change: Sea Level Rise</u>
CTN	97.2004	<i>Gustavo BERGANTIÑOS and Juan J. VIDAL-PUGA</i> : <u>Defining Rules in Cost Spanning Tree Problems Through the Canonical Form</u>
CTN	98.2004	<i>Siddhartha BANDYOPADHYAY and Mandar OAK</i> : <u>Party Formation and Coalitional Bargaining in a Model of Proportional Representation</u>
GG	99.2004	<i>Hans-Peter WEIKARD, Michael FINUS and Juan-Carlos ALTAMIRANO-CABRERA</i> : <u>The Impact of Surplus Sharing on the Stability of International Climate Agreements</u>
SIEV	100.2004	<i>Chiara M. TRAVISI and Peter NIJKAMP</i> : <u>Willingness to Pay for Agricultural Environmental Safety: Evidence from a Survey of Milan, Italy, Residents</u>
SIEV	101.2004	<i>Chiara M. TRAVISI, Raymond J. G. M. FLORAX and Peter NIJKAMP</i> : <u>A Meta-Analysis of the Willingness to Pay for Reductions in Pesticide Risk Exposure</u>
NRM	102.2004	<i>Valentina BOSETTI and David TOMBERLIN</i> : <u>Real Options Analysis of Fishing Fleet Dynamics: A Test</u>
CCMP	103.2004	<i>Alessandra GORIA e Gretel GAMBARELLI</i> : <u>Economic Evaluation of Climate Change Impacts and Adaptability in Italy</u>
PRA	104.2004	<i>Massimo FLORIO and Mara GRASSEN</i> : <u>The Missing Shock: The Macroeconomic Impact of British Privatisation</u>
PRA	105.2004	<i>John BENNETT, Saul ESTRIN, James MAW and Giovanni URG</i> : <u>Privatisation Methods and Economic Growth in Transition Economies</u>
PRA	106.2004	<i>Kira BÖRNER</i> : <u>The Political Economy of Privatization: Why Do Governments Want Reforms?</u>
PRA	107.2004	<i>Pehr-Johan NORBÄCK and Lars PERSSON</i> : <u>Privatization and Restructuring in Concentrated Markets</u>
SIEV	108.2004	<i>Angela GRANZOTTO, Fabio PRANOVI, Simone LIBRALATO, Patrizia TORRICELLI and Danilo MAINARDI</i> : <u>Comparison between Artisanal Fishery and Manila Clam Harvesting in the Venice Lagoon by Using Ecosystem Indicators: An Ecological Economics Perspective</u>
CTN	109.2004	<i>Somdeb LAHIRI</i> : <u>The Cooperative Theory of Two Sided Matching Problems: A Re-examination of Some Results</u>
NRM	110.2004	<i>Giuseppe DI VITA</i> : <u>Natural Resources Dynamics: Another Look</u>
SIEV	111.2004	<i>Anna ALBERINI, Alistair HUNT and Anil MARKANDYA</i> : <u>Willingness to Pay to Reduce Mortality Risks: Evidence from a Three-Country Contingent Valuation Study</u>
KTHC	112.2004	<i>Valeria PAPPONETTI and Dino PINELLI</i> : <u>Scientific Advice to Public Policy-Making</u>
SIEV	113.2004	<i>Paulo A.L.D. NUNES and Laura ONOFRI</i> : <u>The Economics of Warm Glow: A Note on Consumer's Behavior and Public Policy Implications</u>
IEM	114.2004	<i>Patrick CAYRADE</i> : <u>Investments in Gas Pipelines and Liquefied Natural Gas Infrastructure What is the Impact on the Security of Supply?</u>
IEM	115.2004	<i>Valeria COSTANTINI and Francesco GRACCEVA</i> : <u>Oil Security. Short- and Long-Term Policies</u>

ITEM	116.2004	<i>Valeria COSTANTINI and Francesco GRACCEVA: <u>Social Costs of Energy Disruptions</u></i>
ITEM	117.2004	<i>Christian EGENHOFER, Kyriakos GIALOGLOU, Giacomo LUCIANI, Maroeska BOOTS, Martin SCHEEPERS, Valeria COSTANTINI, Francesco GRACCEVA, Anil MARKANDYA and Giorgio VICINI: <u>Market-Based Options for Security of Energy Supply</u></i>
ITEM	118.2004	<i>David FISK: <u>Transport Energy Security. The Unseen Risk?</u></i>
ITEM	119.2004	<i>Giacomo LUCIANI: <u>Security of Supply for Natural Gas Markets. What is it and What is it not?</u></i>
ITEM	120.2004	<i>L.J. de VRIES and R.A. HAKVOORT: <u>The Question of Generation Adequacy in Liberalised Electricity Markets</u></i>
KTHC	121.2004	<i>Alberto PETRUCCI: <u>Asset Accumulation, Fertility Choice and Nondegenerate Dynamics in a Small Open Economy</u></i>
NRM	122.2004	<i>Carlo GIUPPONI, Jaroslaw MYSLAK and Anita FASSIO: <u>An Integrated Assessment Framework for Water Resources Management: A DSS Tool and a Pilot Study Application</u></i>
NRM	123.2004	<i>Margaretha BREIL, Anita FASSIO, Carlo GIUPPONI and Paolo ROSATO: <u>Evaluation of Urban Improvement on the Islands of the Venice Lagoon: A Spatially-Distributed Hedonic-Hierarchical Approach</u></i>
ETA	124.2004	<i>Paul MENSINK: <u>Instant Efficient Pollution Abatement Under Non-Linear Taxation and Asymmetric Information: The Differential Tax Revisited</u></i>
NRM	125.2004	<i>Mauro FABIANO, Gabriella CAMARSA, Rosanna DURSI, Roberta IVALDI, Valentina MARIN and Francesca PALMISANI: <u>Integrated Environmental Study for Beach Management: A Methodological Approach</u></i>
PRA	126.2004	<i>Irena GROSFELD and Iraj HASHI: <u>The Emergence of Large Shareholders in Mass Privatized Firms: Evidence from Poland and the Czech Republic</u></i>
CCMP	127.2004	<i>Maria BERRITTELLA, Andrea BIGANO, Roberto ROSON and Richard S.J. TOL: <u>A General Equilibrium Analysis of Climate Change Impacts on Tourism</u></i>
CCMP	128.2004	<i>Reyer GERLAGH: <u>A Climate-Change Policy Induced Shift from Innovations in Energy Production to Energy Savings</u></i>
NRM	129.2004	<i>Elissaios PAPYRAKIS and Reyer GERLAGH: <u>Natural Resources, Innovation, and Growth</u></i>
PRA	130.2004	<i>Bernardo BORTOLOTTI and Mara FACCIO: <u>Reluctant Privatization</u></i>
SIEV	131.2004	<i>Riccardo SCARPA and Mara THIENE: <u>Destination Choice Models for Rock Climbing in the Northeast Alps: A Latent-Class Approach Based on Intensity of Participation</u></i>
SIEV	132.2004	<i>Riccardo SCARPA Kenneth G. WILLIS and Melinda ACUTT: <u>Comparing Individual-Specific Benefit Estimates for Public Goods: Finite Versus Continuous Mixing in Logit Models</u></i>
ITEM	133.2004	<i>Santiago J. RUBIO: <u>On Capturing Oil Rents with a National Excise Tax Revisited</u></i>
ETA	134.2004	<i>Ascensión ANDINA DÍAZ: <u>Political Competition when Media Create Candidates' Charisma</u></i>
SIEV	135.2004	<i>Anna ALBERINI: <u>Robustness of VSL Values from Contingent Valuation Surveys</u></i>
CCMP	136.2004	<i>Gernot KLEPPER and Sonja PETERSON: <u>Marginal Abatement Cost Curves in General Equilibrium: The Influence of World Energy Prices</u></i>
ETA	137.2004	<i>Herbert DAWID, Christophe DEISSENBERG and Pavel ŠEVČIK: <u>Cheap Talk, Gullibility, and Welfare in an Environmental Taxation Game</u></i>
CCMP	138.2004	<i>ZhongXiang ZHANG: <u>The World Bank's Prototype Carbon Fund and China</u></i>
CCMP	139.2004	<i>Reyer GERLAGH and Marjan W. HOFKES: <u>Time Profile of Climate Change Stabilization Policy</u></i>
NRM	140.2004	<i>Chiara D'ALPAOS and Michele MORETTO: <u>The Value of Flexibility in the Italian Water Service Sector: A Real Option Analysis</u></i>
PRA	141.2004	<i>Patrick BAJARI, Stephanie HOUGHTON and Steven TADELIS (lxxi): <u>Bidding for Incomplete Contracts</u></i>
PRA	142.2004	<i>Susan ATHEY, Jonathan LEVIN and Enrique SEIRA (lxxi): <u>Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions</u></i>
PRA	143.2004	<i>David GOLDREICH (lxxi): <u>Behavioral Biases of Dealers in U.S. Treasury Auctions</u></i>
PRA	144.2004	<i>Roberto BURGUET (lxxi): <u>Optimal Procurement Auction for a Buyer with Downward Sloping Demand: More Simple Economics</u></i>
PRA	145.2004	<i>Ali HORTACSU and Samita SAREEN (lxxi): <u>Order Flow and the Formation of Dealer Bids: An Analysis of Information and Strategic Behavior in the Government of Canada Securities Auctions</u></i>
PRA	146.2004	<i>Victor GINSBURGH, Patrick LEGROS and Nicolas SAHUGUET (lxxi): <u>How to Win Twice at an Auction. On the Incidence of Commissions in Auction Markets</u></i>
PRA	147.2004	<i>Claudio MEZZETTI, Aleksandar PEKEČ and Ilia TSETLIN (lxxi): <u>Sequential vs. Single-Round Uniform-Price Auctions</u></i>
PRA	148.2004	<i>John ASKER and Estelle CANTILLON (lxxi): <u>Equilibrium of Scoring Auctions</u></i>
PRA	149.2004	<i>Philip A. HAILE, Han HONG and Matthew SHUM (lxxi): <u>Nonparametric Tests for Common Values in First-Price Sealed-Bid Auctions</u></i>
PRA	150.2004	<i>François DEGEORGE, François DERRIEN and Kent L. WOMACK (lxxi): <u>Quid Pro Quo in IPOs: Why Bookbuilding is Dominating Auctions</u></i>
CCMP	151.2004	<i>Barbara BUCHNER and Silvia DALL'OLIO: <u>Russia: The Long Road to Ratification. Internal Institution and Pressure Groups in the Kyoto Protocol's Adoption Process</u></i>
CCMP	152.2004	<i>Carlo CARRARO and Marzio GALEOTTI: <u>Does Endogenous Technical Change Make a Difference in Climate Policy Analysis? A Robustness Exercise with the FEEM-RICE Model</u></i>
PRA	153.2004	<i>Alejandro M. MANELLI and Daniel R. VINCENT (lxxi): <u>Multidimensional Mechanism Design: Revenue Maximization and the Multiple-Good Monopoly</u></i>
ETA	154.2004	<i>Nicola ACOCELLA, Giovanni Di BARTOLOMEO and Wilfried PAUWELS: <u>Is there any Scope for Corporatism in Stabilization Policies?</u></i>
CTN	155.2004	<i>Johan EYCKMANS and Michael FINUS: <u>An Almost Ideal Sharing Scheme for Coalition Games with Externalities</u></i>
CCMP	156.2004	<i>Cesare DOSI and Michele MORETTO: <u>Environmental Innovation, War of Attrition and Investment Grants</u></i>

CCMP	157.2004	<i>Valentina BOSETTI, Marzio GALEOTTI and Alessandro LANZA: <u>How Consistent are Alternative Short-Term Climate Policies with Long-Term Goals?</u></i>
ETA	158.2004	<i>Y. Hossein FARZIN and Ken-Ichi AKAO: <u>Non-pecuniary Value of Employment and Individual Labor Supply</u></i>
ETA	159.2004	<i>William BROCK and Anastasios XEPAPADEAS: <u>Spatial Analysis: Development of Descriptive and Normative Methods with Applications to Economic-Ecological Modelling</u></i>
KTHC	160.2004	<i>Alberto PETRUCCI: <u>On the Incidence of a Tax on PureRent with Infinite Horizons</u></i>
IEM	161.2004	<i>Xavier LABANDEIRA, José M. LABEAGA and Miguel RODRÍGUEZ: <u>Microsimulating the Effects of Household Energy Price Changes in Spain</u></i>

NOTE DI LAVORO PUBLISHED IN 2005

CCMP	1.2005	<i>Stéphane HALLEGATTE: <u>Accounting for Extreme Events in the Economic Assessment of Climate Change</u></i>
CCMP	2.2005	<i>Qiang WU and Paulo Augusto NUNES: <u>Application of Technological Control Measures on Vehicle Pollution: A Cost-Benefit Analysis in China</u></i>
CCMP	3.2005	<i>Andrea BIGANO, Jacqueline M. HAMILTON, Maren LAU, Richard S.J. TOL and Yuan ZHOU: <u>A Global Database of Domestic and International Tourist Numbers at National and Subnational Level</u></i>
CCMP	4.2005	<i>Andrea BIGANO, Jacqueline M. HAMILTON and Richard S.J. TOL: <u>The Impact of Climate on Holiday Destination Choice</u></i>
ETA	5.2005	<i>Hubert KEMPF: <u>Is Inequality Harmful for the Environment in a Growing Economy?</u></i>
CCMP	6.2005	<i>Valentina BOSETTI, Carlo CARRARO and Marzio GALEOTTI: <u>The Dynamics of Carbon and Energy Intensity in a Model of Endogenous Technical Change</u></i>
IEM	7.2005	<i>David CALEF and Robert GOBLE: <u>The Allure of Technology: How France and California Promoted Electric Vehicles to Reduce Urban Air Pollution</u></i>
ETA	8.2005	<i>Lorenzo PELLEGRINI and Reyer GERLAGH: <u>An Empirical Contribution to the Debate on Corruption Democracy and Environmental Policy</u></i>
CCMP	9.2005	<i>Angelo ANTOCI: <u>Environmental Resources Depletion and Interplay Between Negative and Positive Externalities in a Growth Model</u></i>
CTN	10.2005	<i>Frédéric DEROLAN: <u>Cost-Reducing Alliances and Local Spillovers</u></i>
NRM	11.2005	<i>Francesco SINDICO: <u>The GMO Dispute before the WTO: Legal Implications for the Trade and Environment Debate</u></i>
KTHC	12.2005	<i>Carla MASSIDDA: <u>Estimating the New Keynesian Phillips Curve for Italian Manufacturing Sectors</u></i>
KTHC	13.2005	<i>Michele MORETTO and Gianpaolo ROSSINI: <u>Start-up Entry Strategies: Employer vs. Nonemployer firms</u></i>
PRCG	14.2005	<i>Clara GRAZIANO and Annalisa LUPORINI: <u>Ownership Concentration, Monitoring and Optimal Board Structure</u></i>
CSRM	15.2005	<i>Parashar KULKARNI: <u>Use of Ecolabels in Promoting Exports from Developing Countries to Developed Countries: Lessons from the Indian LeatherFootwear Industry</u></i>
KTHC	16.2005	<i>Adriana DI LIBERTO, Roberto MURA and Francesco PIGLIARU: <u>How to Measure the Unobservable: A Panel Technique for the Analysis of TFP Convergence</u></i>
KTHC	17.2005	<i>Alireza NAGHAVI: <u>Asymmetric Labor Markets, Southern Wages, and the Location of Firms</u></i>
KTHC	18.2005	<i>Alireza NAGHAVI: <u>Strategic Intellectual Property Rights Policy and North-South Technology Transfer</u></i>
KTHC	19.2005	<i>Mombert HOPPE: <u>Technology Transfer Through Trade</u></i>
PRCG	20.2005	<i>Roberto ROSON: <u>Platform Competition with Endogenous Multihoming</u></i>
CCMP	21.2005	<i>Barbara BUCHNER and Carlo CARRARO: <u>Regional and Sub-Global Climate Blocs. A Game Theoretic Perspective on Bottom-up Climate Regimes</u></i>
IEM	22.2005	<i>Fausto CAVALLARO: <u>An Integrated Multi-Criteria System to Assess Sustainable Energy Options: An Application of the Promethee Method</u></i>
CTN	23.2005	<i>Michael FINUS, Pierre v. MOUCHE and Bianca RUNDSHAGEN: <u>Uniqueness of Coalitional Equilibria</u></i>
IEM	24.2005	<i>Wietze LISE: <u>Decomposition of CO2 Emissions over 1980–2003 in Turkey</u></i>
CTN	25.2005	<i>Somdeb LAHIRI: <u>The Core of Directed Network Problems with Quotas</u></i>
SIEV	26.2005	<i>Susanne MENZEL and Riccardo SCARPA: <u>Protection Motivation Theory and Contingent Valuation: Perceived Realism, Threat and WTP Estimates for Biodiversity Protection</u></i>
NRM	27.2005	<i>Massimiliano MAZZANTI and Anna MONTINI: <u>The Determinants of Residential Water Demand Empirical Evidence for a Panel of Italian Municipalities</u></i>
CCMP	28.2005	<i>Laurent GILOTTE and Michel de LARA: <u>Precautionary Effect and Variations of the Value of Information</u></i>
NRM	29.2005	<i>Paul SARFO-MENSAH: <u>Exportation of Timber in Ghana: The Menace of Illegal Logging Operations</u></i>
CCMP	30.2005	<i>Andrea BIGANO, Alessandra GORIA, Jacqueline HAMILTON and Richard S.J. TOL: <u>The Effect of Climate Change and Extreme Weather Events on Tourism</u></i>
NRM	31.2005	<i>Maria Angeles GARCIA-VALIÑAS: <u>Decentralization and Environment: An Application to Water Policies</u></i>
NRM	32.2005	<i>Chiara D'ALPAOS, Cesare DOSI and Michele MORETTO: <u>Concession Length and Investment Timing Flexibility</u></i>
CCMP	33.2005	<i>Joseph HUBER: <u>Key Environmental Innovations</u></i>
CTN	34.2005	<i>Antoni CALVÓ-ARMENGOL and Rahmi İLKILIÇ (Ixxii): <u>Pairwise-Stability and Nash Equilibria in Network Formation</u></i>
CTN	35.2005	<i>Francesco FERI (Ixxii): <u>Network Formation with Endogenous Decay</u></i>
CTN	36.2005	<i>Frank H. PAGE, Jr. and Myrna H. WOODERS (Ixxii): <u>Strategic Basins of Attraction, the Farsighted Core, and Network Formation Games</u></i>

CTN	37.2005	<i>Alessandra CASELLA and Nobuyuki HANAKI</i> (lxxii): <u>Information Channels in Labor Markets. On the Resilience of Referral Hiring</u>
CTN	38.2005	<i>Matthew O. JACKSON and Alison WATTS</i> (lxxii): <u>Social Games: Matching and the Play of Finitely Repeated Games</u>
CTN	39.2005	<i>Anna BOGOMOLNAIA, Michel LE BRETON, Alexei SAVVATEEV and Shlomo WEBER</i> (lxxii): <u>The Egalitarian Sharing Rule in Provision of Public Projects</u>
CTN	40.2005	<i>Francesco FERI</i> : <u>Stochastic Stability in Network with Decay</u>
CTN	41.2005	<i>Aart de ZEEUW</i> (lxxii): <u>Dynamic Effects on the Stability of International Environmental Agreements</u>
NRM	42.2005	<i>C. Martijn van der HEIDE, Jeroen C.J.M. van den BERGH, Ekko C. van IERLAND and Paulo A.L.D. NUNES</i> : <u>Measuring the Economic Value of Two Habitat Defragmentation Policy Scenarios for the Veluwe, The Netherlands</u>
PRCG	43.2005	<i>Carla VIEIRA and Ana Paula SERRA</i> : <u>Abnormal Returns in Privatization Public Offerings: The Case of Portuguese Firms</u>
SIEV	44.2005	<i>Anna ALBERINI, Valentina ZANATTA and Paolo ROSATO</i> : <u>Combining Actual and Contingent Behavior to Estimate the Value of Sports Fishing in the Lagoon of Venice</u>
CTN	45.2005	<i>Michael FINUS and Bianca RUNDSHAGEN</i> : <u>Participation in International Environmental Agreements: The Role of Timing and Regulation</u>
CCMP	46.2005	<i>Lorenzo PELLEGRINI and Reyer GERLAGH</i> : <u>Are EU Environmental Policies Too Demanding for New Members States?</u>
IEM	47.2005	<i>Matteo MANERA</i> : <u>Modeling Factor Demands with SEM and VAR: An Empirical Comparison</u>
CTN	48.2005	<i>Olivier TERCIEUX and Vincent VANNETELBOSCH</i> (lxx): <u>A Characterization of Stochastically Stable Networks</u>
CTN	49.2005	<i>Ana MAULEON, José SEMPERE-MONERRIS and Vincent J. VANNETELBOSCH</i> (lxxii): <u>R&D Networks Among Unionized Firms</u>
CTN	50.2005	<i>Carlo CARRARO, Johan EYCKMANS and Michael FINUS</i> : <u>Optimal Transfers and Participation Decisions in International Environmental Agreements</u>
KTHC	51.2005	<i>Valeria GATTAI</i> : <u>From the Theory of the Firm to FDI and Internalisation: A Survey</u>
CCMP	52.2005	<i>Alireza NAGHAVI</i> : <u>Multilateral Environmental Agreements and Trade Obligations: A Theoretical Analysis of the Doha Proposal</u>
SIEV	53.2005	<i>Margaretha BREIL, Gretel GAMBARELLI and Paulo A.L.D. NUNES</i> : <u>Economic Valuation of On Site Material Damages of High Water on Economic Activities based in the City of Venice: Results from a Dose-Response-Expert-Based Valuation Approach</u>
ETA	54.2005	<i>Alessandra del BOCA, Marzio GALEOTTI, Charles P. HIMMELBERG and Paola ROTA</i> : <u>Investment and Time to Plan: A Comparison of Structures vs. Equipment in a Panel of Italian Firms</u>
CCMP	55.2005	<i>Gernot KLEPPER and Sonja PETERSON</i> : <u>Emissions Trading, CDM, JI, and More – The Climate Strategy of the EU</u>
ETA	56.2005	<i>Maia DAVID and Bernard SINCLAIR-DESGAGNÉ</i> : <u>Environmental Regulation and the Eco-Industry</u>
ETA	57.2005	<i>Alain-Désiré NIMUBONA and Bernard SINCLAIR-DESGAGNÉ</i> : <u>The Pigouvian Tax Rule in the Presence of an Eco-Industry</u>
NRM	58.2005	<i>Helmut KARL, Antje MÖLLER, Ximena MATUS, Edgar GRANDE and Robert KAISER</i> : <u>Environmental Innovations: Institutional Impacts on Co-operations for Sustainable Development</u>
SIEV	59.2005	<i>Dimitra VOUVAKI and Anastasios XEPAPADEAS</i> (lxxiii): <u>Criteria for Assessing Sustainable Development: Theoretical Issues and Empirical Evidence for the Case of Greece</u>
CCMP	60.2005	<i>Andreas LÖSCHEL and Dirk T.G. RÜBBELKE</i> : <u>Impure Public Goods and Technological Interdependencies</u>
PRCG	61.2005	<i>Christoph A. SCHALTEGGER and Benno TORGLER</i> : <u>Trust and Fiscal Performance: A Panel Analysis with Swiss Data</u>
ETA	62.2005	<i>Irene VALSECCHI</i> : <u>A Role for Instructions</u>
NRM	63.2005	<i>Valentina BOSETTI and Gianni LOCATELLI</i> : <u>A Data Envelopment Analysis Approach to the Assessment of Natural Parks' Economic Efficiency and Sustainability. The Case of Italian National Parks</u>
SIEV	64.2005	<i>Arianne T. de BLAEIJ, Paulo A.L.D. NUNES and Jeroen C.J.M. van den BERGH</i> : <u>Modeling 'No-choice' Responses in Attribute Based Valuation Surveys</u>
CTN	65.2005	<i>Carlo CARRARO, Carmen MARCHIORI and Alessandra SGOBBI</i> : <u>Applications of Negotiation Theory to Water Issues</u>
CTN	66.2005	<i>Carlo CARRARO, Carmen MARCHIORI and Alessandra SGOBBI</i> : <u>Advances in Negotiation Theory: Bargaining, Coalitions and Fairness</u>
KTHC	67.2005	<i>Sandra WALLMAN</i> (lxxiv): <u>Network Capital and Social Trust: Pre-Conditions for 'Good' Diversity?</u>
KTHC	68.2005	<i>Asimina CHRISTOFOROU</i> (lxxiv): <u>On the Determinants of Social Capital in Greece Compared to Countries of the European Union</u>
KTHC	69.2005	<i>Eric M. USLANER</i> (lxxiv): <u>Varieties of Trust</u>
KTHC	70.2005	<i>Thomas P. LYON</i> (lxxiv): <u>Making Capitalism Work: Social Capital and Economic Growth in Italy, 1970-1995</u>
KTHC	71.2005	<i>Graziella BERTOCCHI and Chiara STROZZI</i> (lxxv): <u>Citizenship Laws and International Migration in Historical Perspective</u>
KTHC	72.2005	<i>Elsbeth van HYLCKAMA Vlieg</i> (lxxv): <u>Accommodating Differences</u>
KTHC	73.2005	<i>Renato SANSA and Ercole SORI</i> (lxxv): <u>Governance of Diversity Between Social Dynamics and Conflicts in Multicultural Cities. A Selected Survey on Historical Bibliography</u>
IEM	74.2005	<i>Alberto LONGO and Anil MARKANDYA</i> : <u>Identification of Options and Policy Instruments for the Internalisation of External Costs of Electricity Generation. Dissemination of External Costs of Electricity Supply Making Electricity External Costs Known to Policy-Makers</u> <u>MAXIMA</u>

IEM	75.2005	<i>Margherita GRASSO and Matteo MANERA: <u>Asymmetric Error Correction Models for the Oil-Gasoline Price Relationship</u></i>
ETA	76.2005	<i>Umberto CHERUBINI and Matteo MANERA: <u>Hunting the Living Dead A “Peso Problem” in Corporate Liabilities Data</u></i>
CTN	77.2005	<i>Hans-Peter WEIKARD: <u>Cartel Stability under an Optimal Sharing Rule</u></i>
ETA	78.2005	<i>Joëlle NOAILLY, Jeroen C.J.M. van den BERGH and Cees A. WITHAGEN (lxxvi): <u>Local and Global Interactions in an Evolutionary Resource Game</u></i>
ETA	79.2005	<i>Joëlle NOAILLY, Cees A. WITHAGEN and Jeroen C.J.M. van den BERGH (lxxvi): <u>Spatial Evolution of Social Norms in a Common-Pool Resource Game</u></i>
CCMP	80.2005	<i>Massimiliano MAZZANTI and Roberto ZOBOLI: <u>Economic Instruments and Induced Innovation: The Case of End-of-Life Vehicles European Policies</u></i>
NRM	81.2005	<i>Anna LASUT: <u>Creative Thinking and Modelling for the Decision Support in Water Management</u></i>
CCMP	82.2005	<i>Valentina BOSETTI and Barbara BUCHNER: <u>Using Data Envelopment Analysis to Assess the Relative Efficiency of Different Climate Policy Portfolios</u></i>
ETA	83.2005	<i>Ignazio MUSU: <u>Intellectual Property Rights and Biotechnology: How to Improve the Present Patent System</u></i>
KTHC	84.2005	<i>Giulio CAINELLI, Susanna MANCINELLI and Massimiliano MAZZANTI: <u>Social Capital, R&D and Industrial Districts</u></i>
ETA	85.2005	<i>Rosella LEVAGGI, Michele MORETTO and Vincenzo REBBA: <u>Quality and Investment Decisions in Hospital Care when Physicians are Devoted Workers</u></i>
CCMP	86.2005	<i>Valentina BOSETTI and Laurent GILOTTE: <u>Carbon Capture and Sequestration: How Much Does this Uncertain Option Affect Near-Term Policy Choices?</u></i>
CSRM	87.2005	<i>Nicoletta FERRO: <u>Value Through Diversity: Microfinance and Islamic Finance and Global Banking</u></i>
ETA	88.2005	<i>A. MARKANDYA and S. PEDROSO: <u>How Substitutable is Natural Capital?</u></i>
IEM	89.2005	<i>Anil MARKANDYA, Valeria COSTANTINI, Francesco GRACCEVA and Giorgio VICINI: <u>Security of Energy Supply: Comparing Scenarios From a European Perspective</u></i>
CCMP	90.2005	<i>Vincent M. OTTO, Andreas LÖSCHEL and Rob DELLINK: <u>Energy Biased Technical Change: A CGE Analysis</u></i>
PRCG	91.2005	<i>Carlo CAPUANO: <u>Abuse of Competitive Fringe</u></i>
PRCG	92.2005	<i>Ulrich BINDSEIL, Kjell G. NYBORG and Ilya A. STREBULAIEV (lxv): <u>Bidding and Performance in Repo Auctions: Evidence from ECB Open Market Operations</u></i>
CCMP	93.2005	<i>Sabrina AUCI and Leonardo BECCHETTI: <u>The Stability of the Adjusted and Unadjusted Environmental Kuznets Curve</u></i>
CCMP	94.2005	<i>Francesco BOSELLO and Jian ZHANG: <u>Assessing Climate Change Impacts: Agriculture</u></i>
CTN	95.2005	<i>Alejandro CAPARRÓS, Jean-Christophe PEREAU and Tarik TAZDAÏT: <u>Bargaining with Non-Monolithic Players</u></i>
ETA	96.2005	<i>William BROCK and Anastasios XEPAPADEAS (lxxvi): <u>Optimal Control and Spatial Heterogeneity: Pattern Formation in Economic-Ecological Models</u></i>
CCMP	97.2005	<i>Francesco BOSELLO, Roberto ROSON and Richard S.J. TOL (lxxvii): <u>Economy-Wide Estimates of the Implications of Climate Change: Human Health</u></i>
CCMP	98.2005	<i>Rob DELLINK, Michael FINUS and Niels OLIEMAN: <u>Coalition Formation under Uncertainty: The Stability Likelihood of an International Climate Agreement</u></i>
CTN	99.2005	<i>Valeria COSTANTINI, Riccardo CRESCENZI, Fabrizio De FILIPPIS, and Luca SALVATICI: <u>Bargaining Coalitions in the Agricultural Negotiations of the Doha Round: Similarity of Interests or Strategic Choices? An Empirical Assessment</u></i>
IEM	100.2005	<i>Giliola FREY and Matteo MANERA: <u>Econometric Models of Asymmetric Price Transmission</u></i>
IEM	101.2005	<i>Alessandro COLOGNI and Matteo MANERA: <u>Oil Prices, Inflation and Interest Rates in a Structural Cointegrated VAR Model for the G-7 Countries</u></i>
KTHC	102.2005	<i>Chiara M. TRAVISI and Roberto CAMAGNI: <u>Sustainability of Urban Sprawl: Environmental-Economic Indicators for the Analysis of Mobility Impact in Italy</u></i>
ETA	103.2005	<i>Livingstone S. LUBOOBI and Joseph Y.T. MUGISHA: <u>HIV/AIDS Pandemic in Africa: Trends and Challenges</u></i>

- (lxv) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications” organised by Fondazione Eni Enrico Mattei and sponsored by the EU, Milan, September 25-27, 2003
- (lxvi) This paper has been presented at the 4th BioEcon Workshop on “Economic Analysis of Policies for Biodiversity Conservation” organised on behalf of the BIOECON Network by Fondazione Eni Enrico Mattei, Venice International University (VIU) and University College London (UCL) , Venice, August 28-29, 2003
- (lxvii) This paper has been presented at the international conference on “Tourism and Sustainable Economic Development – Macro and Micro Economic Issues” jointly organised by CRENoS (Università di Cagliari e Sassari, Italy) and Fondazione Eni Enrico Mattei, and supported by the World Bank, Sardinia, September 19-20, 2003
- (lxviii) This paper was presented at the ENGIME Workshop on “Governance and Policies in Multicultural Cities”, Rome, June 5-6, 2003
- (lxix) This paper was presented at the Fourth EEP Plenary Workshop and EEP Conference “The Future of Climate Policy”, Cagliari, Italy, 27-28 March 2003
- (lxx) This paper was presented at the 9th Coalition Theory Workshop on "Collective Decisions and Institutional Design" organised by the Universitat Autònoma de Barcelona and held in Barcelona, Spain, January 30-31, 2004
- (lxxi) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications”, organised by Fondazione Eni Enrico Mattei and Consip and sponsored by the EU, Rome, September 23-25, 2004
- (lxxii) This paper was presented at the 10th Coalition Theory Network Workshop held in Paris, France on 28-29 January 2005 and organised by EUREQua.
- (lxxiii) This paper was presented at the 2nd Workshop on "Inclusive Wealth and Accounting Prices" held in Trieste, Italy on 13-15 April 2005 and organised by the Ecological and Environmental Economics - EEE Programme, a joint three-year programme of ICTP - The Abdus Salam International Centre for Theoretical Physics, FEEM - Fondazione Eni Enrico Mattei, and The Beijer International Institute of Ecological Economics
- (lxxiv) This paper was presented at the ENGIME Workshop on “Trust and social capital in multicultural cities” Athens, January 19-20, 2004
- (lxxv) This paper was presented at the ENGIME Workshop on “Diversity as a source of growth” Rome November 18-19, 2004
- (lxxvi) This paper was presented at the 3rd Workshop on Spatial-Dynamic Models of Economics and Ecosystems held in Trieste on 11-13 April 2005 and organised by the Ecological and Environmental Economics - EEE Programme, a joint three-year programme of ICTP - The Abdus Salam International Centre for Theoretical Physics, FEEM - Fondazione Eni Enrico Mattei, and The Beijer International Institute of Ecological Economics
- (lxxvii) This paper was presented at the Workshop on Infectious Diseases: Ecological and Economic Approaches held in Trieste on 13-15 April 2005 and organised by the Ecological and Environmental Economics - EEE Programme, a joint three-year programme of ICTP - The Abdus Salam International Centre for Theoretical Physics, FEEM - Fondazione Eni Enrico Mattei, and The Beijer International Institute of Ecological Economics.

2004 SERIES

CCMP	<i>Climate Change Modelling and Policy</i> (Editor: Marzio Galeotti)
GG	<i>Global Governance</i> (Editor: Carlo Carraro)
SIEV	<i>Sustainability Indicators and Environmental Valuation</i> (Editor: Anna Alberini)
NRM	<i>Natural Resources Management</i> (Editor: Carlo Giupponi)
KTHC	<i>Knowledge, Technology, Human Capital</i> (Editor: Gianmarco Ottaviano)
IEM	<i>International Energy Markets</i> (Editor: Anil Markandya)
CSRM	<i>Corporate Social Responsibility and Sustainable Management</i> (Editor: Sabina Ratti)
PRA	<i>Privatisation, Regulation, Antitrust</i> (Editor: Bernardo Bortolotti)
ETA	<i>Economic Theory and Applications</i> (Editor: Carlo Carraro)
CTN	<i>Coalition Theory Network</i>

2005 SERIES

CCMP	<i>Climate Change Modelling and Policy</i> (Editor: Marzio Galeotti)
SIEV	<i>Sustainability Indicators and Environmental Valuation</i> (Editor: Anna Alberini)
NRM	<i>Natural Resources Management</i> (Editor: Carlo Giupponi)
KTHC	<i>Knowledge, Technology, Human Capital</i> (Editor: Gianmarco Ottaviano)
IEM	<i>International Energy Markets</i> (Editor: Anil Markandya)
CSRM	<i>Corporate Social Responsibility and Sustainable Management</i> (Editor: Sabina Ratti)
PRCG	<i>Privatisation Regulation Corporate Governance</i> (Editor: Bernardo Bortolotti)
ETA	<i>Economic Theory and Applications</i> (Editor: Carlo Carraro)
CTN	<i>Coalition Theory Network</i>