

Workshop on **Development and Climate**

November 11, 2003
Ashok Hotel, New Delhi

Organizers



**Indian Institute of Management,
Ahmedabad**



**Ministry of Environment and Forests,
Government of India**

Supported by



**UNEP RISØ Centre
Denmark**



**RIVM
The Netherlands**

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Context and Scope

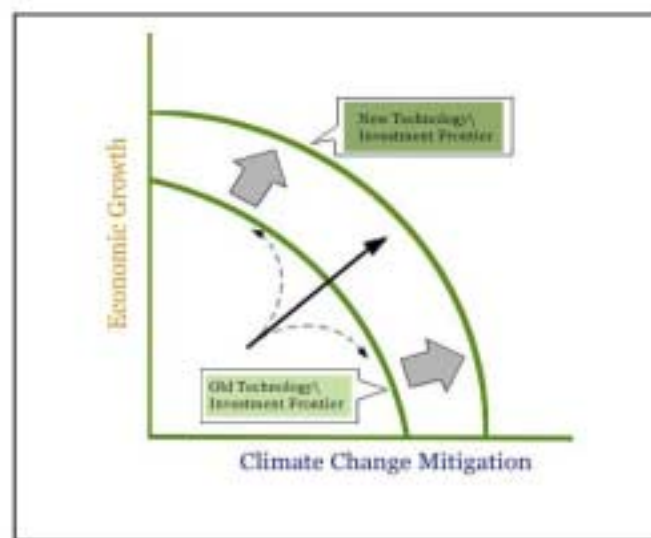
The global climate change is an added barrier in India's development pathway. There are several key development concerns that could be adversely impacted by climate change. While the development process is removing many barriers and helping the country's socio-economic and natural systems to become more resilient to adversities, there are several areas of vulnerabilities where climate change can lead to adverse impacts and welfare losses. Development and climate thus appear in adverse relationship. A key challenge for developing countries, including India, is to make development the principal instrument for adaptation vis-à-vis the adverse impacts of climate change.

Development encompasses broader societal issues than the economic growth. In recent years, the national development policy perspective has taken a more inclusive view of scope, content and the nature of national development. The conventional paradigm of economic development, which was woven around the optimal resource allocation, is now extended to include participative processes, local initiatives and global interfaces. The new vision views welfare as the *raison d'être* of development. Under the emergent development perspective, while the efficient resource allocation is best addressed by market mechanisms, the institutions are also considered key component in a nation's capacity to use resources optimally. The institutions and policies thus have key role in welfare maximizing development. Strong links between the government policies, organizational capacity, and social development outcomes is duly recognized. The provision of resources for social services and the creation of new partnerships for delivery of services are important, and must be implemented within a framework of policies and institutions that provide mechanisms for efficiency and accountability.

Development and Climate : The New Paradigm

Climate change interfaces with diverse societal and natural processes. Through these, it links with the development processes. The conventional view has been to consider climate change a barrier to development and simultaneously the development as threat to climate change. The *development and climate* paradigm views development as the driving force for addressing the climate change challenges, the key to overcoming its vulnerabilities and enhancing capabilities for adaptation to its adverse impacts. The development and climate paradigm, also alternatively referred as the *development first*, views development as the key instrument for dealing with climate change. In this paradigm, the development itself, i.e. building of capacities, institutions and human capital in developing countries, emerges as the central for enhancing adaptive capacities.

Expanding the Development and Climate Frontier



The development and climate view is consistent with the national perspectives on sustainable development. Sustainable development, defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs¹, has been the guiding principle for setting important national policy agenda. The United Nations Conference on Environment and Development

¹ WCED, 1987. World Commission on Environment and Development. *Our common future*. Oxford: Oxford University Press, p. 43.

(UNCED) held in Rio de Janeiro in June 1992 was the milestone event that drew world's attention on environment and development interfaces. This convention exhorted the importance of formulating socio-economic developmental policies with strong connections with the environmental goals. The range of human development in across the world's nations is vast and uneven, with astounding progress in some areas amid stagnation and dismal decline in others². In September 2000, at the UN Millennium Summit, 89 countries adopted the historic Millennium Declaration. The Declaration included eight developmental goals translated into 18 targets for the 21st century. The targets included halving extreme poverty, halving of the proportion of people without sustainable access to safe drinking water, halting the spread of HIV/AIDS and enrolling all boys and girls everywhere in primary schools by 2015. Governments, aid agencies and civil society organizations everywhere are reorienting their work around these goals (UNDP, 2003). These goals have been included, is enhanced in our national planning exercises. Achieving these is vital for development and also as building capacity to respond to climate change.

Delhi Ministerial Declaration

The vital relationship between sustainable development and climate change was recognized in the *Delhi Declaration* made at COP-8 in November 2002. The declaration reiterated the view of the World Summit on Sustainable Development (2002) that poverty eradication, changing unsustainable patterns of production and consumption, and protecting and managing the natural resource base of economic and social development are overarching objectives of, and essential requirements for sustainable development. The Declaration further resolved that climate change related policies and adaptation measures should be appropriately integrated with national development programs of each Party, considering that economic development is essential for adopting measures to address climate change. The Delhi Declaration³ observes that:

“Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change

² UNDP, 2003. Human Development Report: 2003. United Nations Development Programme, Oxford University Press, New York.

³ Delhi Declaration text available at http://unfccc.int/cop8/latest/1_cpl6rev1.pdf

should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change”

Moreover, both WSSD⁴ and *Delhi Declaration* emphasized the need for augmenting *financing* of development and *technology transfer* to developing countries and the need for climate change policies to be aligned with national development priorities of nations as the following excerpts of Delhi Declaration notes:

“Technology transfer should be strengthened, including through concrete projects and capacity-building in all relevant sectors such as energy, transport, industry, health, agriculture, biodiversity, forestry and waste management. Technological advances should be promoted through research and development, economic diversification and strengthening of relevant regional, national and local institutions for sustainable development...”

Vulnerability and Adaptation

Developing countries are especially vulnerable to the climatic changes. One of the effective ways of developing adaptive capacity against the vulnerability to climate change is to augment the socio-economic development of the developing countries. In this context, the Marrakech Accords emphasized the need for capacity building in the developing countries to develop adaptation capabilities. The Delhi Declaration exhorted that:

“Adaptation to the adverse effects of climate change is of high priority for all countries. Developing countries are particularly vulnerable, especially the least developed countries and Small Island developing States. Adaptation requires urgent attention and action on the part of all countries. Effective and result-based measures should be supported for the development of approaches at all levels on vulnerability and adaptation, as well as capacity-building for the integration of adaptation concerns into sustainable development strategies. The measures should include full implementation of existing commitments under the Convention and the Marrakech Accords;”

Capacity Building for adaptation is not sector specific and is much more pervasive on the multifarious economic activities. Hence capacity building for adaptation should take into account the need to develop *institutions* and *human capital*. One of the key means of enhancing capacity is via *knowledge transfer* and *technology transfer*

⁴ WSSD, 2002. Report of the World Summit on Sustainable Development, Johannesburg, South Africa (26 August- 4 September 2002). United Nations, New York.

through diffusible demonstrative projects that could be widely replicated. The Marrakech Accords⁵ envisages supporting the capacity building activities in developing countries as noted in the excerpts from the COP-7 document:

“Stress the importance of capacity-building, as well as of developing and disseminating innovative technologies in respect of key sectors of development, particularly energy, and of investment in this regard, including through private sector involvement, market oriented approaches, as well as supportive public policies and international cooperation;”

Clean Development Mechanism (CDM) was envisaged in the Kyoto Protocol⁶ to support sustainable development in the developing countries while simultaneously the climate change problem is also assuaged. Article 12 of the Kyoto protocol notes that

“The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development...”

Indian Vision 2020

In India, various policies and strategies have been framed to integrate economic and social objectives with the environmental objectives. The sustainable development objectives are an integral part of the various National Five-year plan documents, annual plan documents of respective departments, perspective plans of various Ministries of the Central and State governments, and the Planning Commission documents. In the following sections we try to bring out the specific sustainable development objectives embedded in various plan documents of the state and central government and specify their linkages with climate change. These goals highlight key areas of intervention – from democratic governance to economic stability to health and education - that should guide national efforts and international support for development. The UNDP report acknowledges that fulfilling these goals requires nationally owned, nationally driven development strategies guided by sound science, good economics and transparent, accountable governance. There can be no single framework for development, as these have to be tailored for specific national circumstances of each country.

Government of India has also specified developmental policies and priorities that reflect the concerns expressed in the millennium development goals.

⁵ Marrakech Accords text available at <http://unfccc.int/resource/docs/cop7/13a01.pdf>

⁶ Kyoto Protocol text available at <http://unfccc.int/resource/docs/convkp/kpeng.html>

These Indian targets have been compiled from the Government of India's Tenth Plan document (PC, 2002a) and India Vision 2020. They reflect India's commitment to Rio Declaration (1992) on Agenda-21 at the UN Conference on Environment and Development, Millennium Declaration at the UN Millennium Summit (UNDP, 2003), Johannesburg Declaration at the World Summit on Sustainable Development (2002), and the Delhi Declaration (2002) at the Eighth Conference of Parties.

Many of the national targets are more ambitious than the millennium development goals like doubling the national per capita income by 2012, all villages to have sustained access to potable drinking water by 2007, halting HIV/AIDS spread by 2007, and all children in schools by 2003. These specific development targets address many climate change concerns. For example, reduced poverty and hunger would enhance adaptive capacity of the population due to improved food security, health security and resilience to cope with risks from uncertain and extreme events. Reduced decadal population growth rates would lower GHG emissions, reduce pressure on land, resources, and ecosystems and provide higher access to social infrastructure. Increased reliance on hydro and renewable energy resources would reduce GHG and local pollutant emissions, enhance energy security and consequent economic benefits from lower fossil fuel imports, and provide access to water resources from additional hydro projects. Cleaning of major polluted rivers would result in enhanced adaptive capacity due to improved water, health and food security.

Thus, development and climate change are intricately linked. Development in fact engenders solutions to numerous harmful consequences of future climate change. Achieving national sustainable development goals would automatically address myriad climate change concerns. The cascading effects of sustainable development would also moderate the costs of adverse impacts of climate change and reduce the resulting welfare losses. Table 1 shows how the national development goals are linked to climate change and how achieving these development goals would enhance adaptive capacity.

India Project

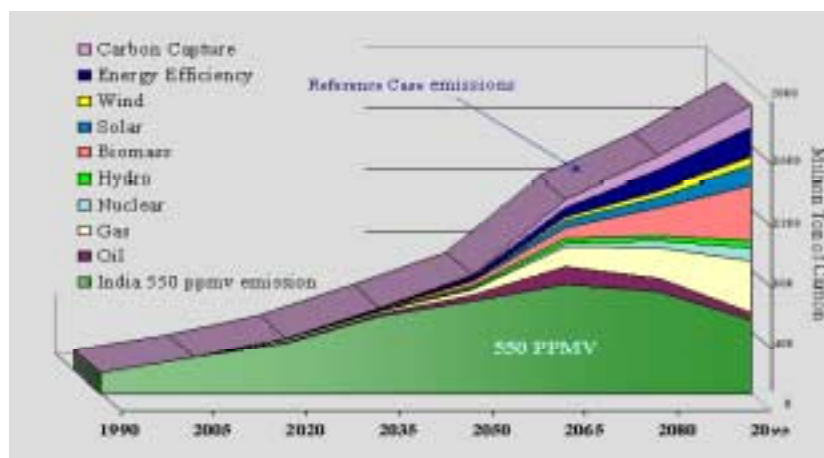
First Phase of India project comprised of six studies on development and climate nexus - Development of Indian Emissions Scenarios, Mitigation and Stabilization Scenarios, Benefits

of South-Asia Regional Cooperation, Water-Energy-Emissions Nexus, Impacts on Long-life Assets (e.g. Infrastructure), Impacts on Energy System in Long-term.

Emissions, Mitigation and Stabilization

Emissions scenarios for India were developed following the IPCC SRES typology. Scenario comparison illustrated that development pathway is the critical determinant of emissions trajectories. Stabilization analysis showed that economic impacts of mitigation depend on stabilization target, underlying development scenario, resource endowments and integration with global economy. The stabilization scenario, e.g. 550 ppmv concentration level, would induce significant changes in India's coal dependent energy system and impose high economic costs. The regional co-operation in South-Asia, with greater access to Himalayan hydro resources and gas markets would reduce energy costs, promote cleaner development and lower emissions. Study on Water-Energy-Emissions Nexus showed that improving irrigation efficiency yields double dividend by reducing energy emissions and vulnerability to climate change.

Indian Energy System Transformation under 550 ppmv Stabilization



Impact and Adaptation

India is making enormous investments in long-life assets like transport infrastructures that are exposed to climate. The Konkan Railways case study examined the impacts of climate change on this major developmental project, laid along the climate sensitive Western Ghats (Mountains). The railway costing \$745 Million passes through 58 tunnels, 1998 bridges and is vulnerable to projected climatic changes. The study revealed that the design and construction of such long-term assets should factor-in climate change induced stresses. Another study examined the impact of climate change on Indian energy system over next 100

years. The assessment showed that adaptive responses to temperature rise and added variability in precipitation would increase energy use and related emissions. The case study demonstrates the nexus between adaptation, emissions and mitigation. Besides these case studies, India project also made initial investigation into adaptation instruments including technological interventions and insurance.



The Second Phase of India Project envisages integrated assessment of mitigation and adaptation challenges, modeling to quantify the assessment, cooperative assessment for South-Asia region and capacity building and networking in Asia.

Table 1: Development goals, targets and climate change

Millennium development goals and global targets¹	India's 10th plan (2002-2007) and beyond targets^{2,3,4}	How these address climate change concerns?
<p>Goal 1: Eradicate extreme poverty and hunger <i>Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than \$1 a day</i> <i>Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger</i></p>	<ul style="list-style-type: none"> ▪ Double the per capita income by 2012 ▪ Reduction of poverty ratio by 5 percentage points by 2007 and by 15 percentage points by 2012 ▪ Reduce decadal population growth rate to 16.2% between 2001-2011 (from 21.3% during 1991-2001) 	<ul style="list-style-type: none"> ▪ Enhanced adaptation capacity due to improved food security, health security and resilience to cope with risks from uncertain and extreme events
<p>Goal 2: Achieve universal primary education <i>Target 3: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling</i></p>	<ul style="list-style-type: none"> ▪ All children in school by 2003; all children to complete 5 years of schooling by 2007 ▪ Increase in literacy rates to 75% by 2007 (from 65% in 2001) 	<ul style="list-style-type: none"> ▪ Enhanced adaptation capacity due to improved skills, flexibility to shift vocations/locations
<p>Goal 3: Promote gender equality and empower women <i>Target 4: Eliminate gender disparity in primary and secondary education, preferably by 2005 and in all levels of education no later than 2015</i></p>	<ul style="list-style-type: none"> ▪ At least halve, between 2002 and 2007, gender gaps in literacy and wage rates 	<ul style="list-style-type: none"> ▪ Enhanced capacity of women to deal with added social risks from climate change
<p>Goal 4: Reduce child mortality <i>Target 5: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate</i></p>	<ul style="list-style-type: none"> ▪ Reduction of Infant mortality rate (IMR) to 45 per 1000 live births by 2007 and to 28 by 2012 (115 in 1980, 70 in 2000) 	<ul style="list-style-type: none"> ▪ Enhanced resilience of children to health effects of climate change due to improved access to health services
<p>Goal 5: Improve maternal health <i>Target 6: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio (MMR)</i></p>	<ul style="list-style-type: none"> ▪ Reduction of MMR to 2 per 1000 live births by 2007 and to 1 by 2012 (from 3 in 2001) 	<ul style="list-style-type: none"> ▪ Enhanced resilience of women to health effects of climate change due to improved access to health services
<p>Goal 6: Combat HIV/AIDS, malaria and other diseases <i>Target 7: Have halted by 2015 and begun to reverse the spread of HIV/AIDS</i> <i>Target 8: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases</i></p>	<ul style="list-style-type: none"> ▪ Have halted by 2007; 80 to 90% coverage of high risk groups, schools, colleges and rural areas for awareness generation by 2007 ▪ 25% reduction in morbidity and mortality due to malaria by 2007 and 50% by 2010 	<ul style="list-style-type: none"> ▪ Higher resilience of the population due to enhanced capacity to deal with epidemics ▪ Enhanced resilience to added risk of Malaria and other vector borne diseases
<p>Goal 7: Ensure environmental sustainability <i>Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources</i></p>	<ul style="list-style-type: none"> ▪ Increase in forest and tree cover to 25% by 2007 and 33% by 2012 (from 23% in 2001) ▪ Sustained access to potable drinking water to all villages by 2007 	<ul style="list-style-type: none"> ▪ Lower GHG emissions and local emissions; lower fossil fuel imports; reduced pressure on land, resources and ecosystems

<p>Target 10: Halve by 2015 the proportion of people without sustainable access to safe drinking water</p> <p>Target 11: Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers</p>	<ul style="list-style-type: none"> ▪ Commission 14.4 GW hydro and 3 GW by other renewables in a total power generation capacity additions of 41.1 GW between 2002-2007 ▪ Electrify 62,000 villages by 2007 through conventional grid expansion, remaining 18,000 by 2012 through decentralized non-conventional sources like solar, wind, small hydro and biomass. ▪ Cleaning of all major polluted rivers by 2007 and other notified stretches by 2012 	<ul style="list-style-type: none"> ▪ Higher adaptive capacity to climate variability due to enhanced water supply ▪ Resilience to cope with health impacts of climate change due to access to clean water and electricity ▪ Higher adaptive capacity due to enhanced reach of health/education facilities dependent on electrical equipments and flexibility of economic activities in rural areas
<p>Goal 8: <u>Develop a global partnership for development</u></p> <p>Target 12: <i>Develop further an open, rule-based, predictable, non-discriminatory trading and financial system (includes a commitment to good governance, development, and poverty reduction - both nationally and internationally)</i></p> <p>Target 16: <i>In cooperation with developing countries, develop and implement strategies for decent and productive work for youth</i></p> <p>Target 17: <i>In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries</i></p> <p>Target 18: <i>In cooperation with the private sector, make available the benefits of new technologies, especially information and communications technologies</i></p>	<ul style="list-style-type: none"> ▪ Expeditious reformulation of the fiscal management system to make it more appropriate for the changed context ▪ Tenth plan includes state-wise break up of the broad developmental targets. ▪ Higher integration with the global economy ▪ Create 50 million employment opportunities by 2007 and 100 million by 2012 (current back-log of unemployment is around 9%, equivalent to 35 million persons) 	<ul style="list-style-type: none"> ▪ Higher resilience to climate change due to enhanced supply of social infrastructure ▪ Higher mitigative and adaptive capacity from access to global resources and technologies ▪ Enhanced flexibility of jobs and migration ▪ Improved capacity to deal with health risks due to access to advanced medicine and health services ▪ Enhanced adaptive capacity to deal with extreme events from access to advanced information and communication systems

Note: Millennium targets 13 and 14 refer to special needs of least developed, land locked and small island countries. India is party to several international conventions and programmes assisting these countries. India is also implementing policies in line with target 15 that exhorts amelioration of debt of developing countries, including own debt, under global cooperation.

Source: ¹ Human Development Report, 2003 (UNDP, 2003)

² Planning Commission (PC, 2002a), Tenth Five Year Plan, Government of India, Vol. 1 (pp 6-8), Vol. 2 (pp 108, 117, 909, 914, 927)

³ For the most recent year between 1985-1999 (UNDP, 2002), pp 176

⁴ Planning Commission (PC, 2002b), India Vision 2020, SP Gupta Committee report, Planning Commission, 2002 (pp 93)

WORKSHOP PROGRAMME

09:00 - 9:30 Registration

9:30 – 10:30 Session I - Inauguration

Welcome and Introduction by Dr. P.R. Shukla, IIM, Ahmedabad

Key Note Address by Dr. R.K. Pachauri, IPCC Chair

Inaugural Address by Dr. Prodipto Ghosh, Secretary, MoEF

10:30 – 11:00 Tea/ Coffee Break

11:00 – 12:30 Session II - Development and Climate: The Paradigm

Session chair: Vijai Sharma, I.A.S.

Development and Climate Perspective, Dr. P.R. Shukla, IIM, Ahmedabad

Development First Project, Dr. Kirsten Halsnaes, UNEP RISØ Center

12:30 – 13:30 Lunch

13:30 – 15:00 Session III - Development and Climate: Case Studies

Session Chair: Dr. Jayant Sathaye, LBNL, USA

INDIA: Speakers from IIMA, IITB, MANIT

SOUTH AFRICA: Dr. Ogunlade Davidson, IPCC WGIII Co-Chair

BANGLADESH: Dr. Saleemul Huq, IIED, London

15:00 – 15:30 Tea/ Coffee Break

15:30 – 17:00 Session IV: Conclusion

Panel Discussion: **Development and Climate: The Next Steps**

Panel Chair: Dr. Prodipto Ghosh, IAS

Panelists: Environment (Mr. C. Vishwanath, JS/ MoEF)
Renewable Energy (Mr. Sunil Khatri, JS/ MNES)
LULUCF (Dr. N.H. Ravindranath, IISc)
Coastal Zone (Dr. Anand Patwardhan, IITB)
Technology (Dr. Jayant Sathaye, LBNL, USA)
Industry Associations (K.P. Nyati, CII)

Summing-up and Conclusions

Book Release

Dr. Prodipto Ghosh, Secretary, Ministry of Environment and Forests will release the book

Climate Change and India: Vulnerability Assessment and Adaptation

Book includes state-of-the-art assessments by recognized Indian experts.

PARTICIPANTS/ INVITEES

Forty invited participants from within the country shall attend the workshop. Participants shall be from diverse segments including government, industry, financial institutions, NGOs and academicians. Besides the Indian participants, some participants from the UNEP and UNFCCC workshop that are also held during the period at the same venue would be invited depending on the availability and suitability. Initial contact is made with the key speakers, session chairs and several organizations. The tentative list of organizations for drawing participants is as under:

Government of India:

Ministry of Environment and Forest
Ministry of Power
Ministry of Agriculture
Ministry of Non-Conventional Energy Sources
Planning Commission
Ministry of Finance

Industry

CII
FICCI
Associated Chamber of Commerce (ASSOCHAM)
Wind Manufacturers Association

Financial Institutes

IDFC
ICICI
CRISIL
General Insurance Corporation

Academic Institutions

IARI
IISc, Bangalore
IIT, Delhi
IIT, Bombay
IIM, Ahmedabad
IIM, Bangalore
Delhi University
JNU

NGOs

Winrock International India
Development Alternatives

UN Organizations (from delegates attending UNEP and UNFCCC workshops)

UNEP
UNFCCC
IPCC

ORGANIZING INSTITUTION

Indian Institute of Management, Ahmedabad (IIMA), established in 1962, is among the foremost institutions for management education and research in the world. Renowned for its academic programs, IIMA also provides advisory and research services to government, corporations, international agencies, and NGOs. Various research groups within IIMA work in the prominent public policy areas. The Public System Group (PSG) of IIMA conducts policy relevant research in diverse areas in the public domain. A key focus area of research for this group is energy and environment policies. Researchers belonging to PSG have done pioneering work in the areas of economic modeling and policy analysis relating to global climate change. Other focus areas of PSG include health and infrastructure policies. The Center for Management in Agriculture (CMA) at IIMA conducts policy research in the areas of sustainable development, agriculture, forestry, water and grass-root innovations. The Ravi J, Mathai Center for Innovative Education (RJMCI) has a unique focus on innovation in education for enhancement of human capital. IIMA contribute significant research in the management of industry and service sectors. The institute conducts numerous programs for executive development and holds seminars, workshops and conferences in key areas of management and development policies.

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