

調査資料 No.111

**「基本計画の達成効果の評価のための調査」
国際ワークショップ開催報告**

(2004 年 9 月 13-14 日、於・東京)

～統合的科学技术政策による効果のベンチマークに向けて～

**International Workshop on the Comprehensive Review
of the S&T Basic Plans in Japan**

(September 13-14, 2004 in Tokyo)

– Toward the benchmarking of the effect by integrated S&T Policy –

2004 年 12 月
December, 2004

**文部科学省 科学技術政策研究所
第 3 調査研究グループ**

Third Policy-Oriented Research Group
National Institute of Science and Technology Policy (NISTEP)
Ministry of Education, Culture, Sports, Science and Technology

International Workshop on the Comprehensive Review of the S&T Basic Plans in Japan
– Toward the benchmarking of the effect by integrated S&T Policy –

September, 2004

Organized by
National Institute of Science and Technology Policy (NISTEP)
&
The Japan Research Institute, Limited (JRI)

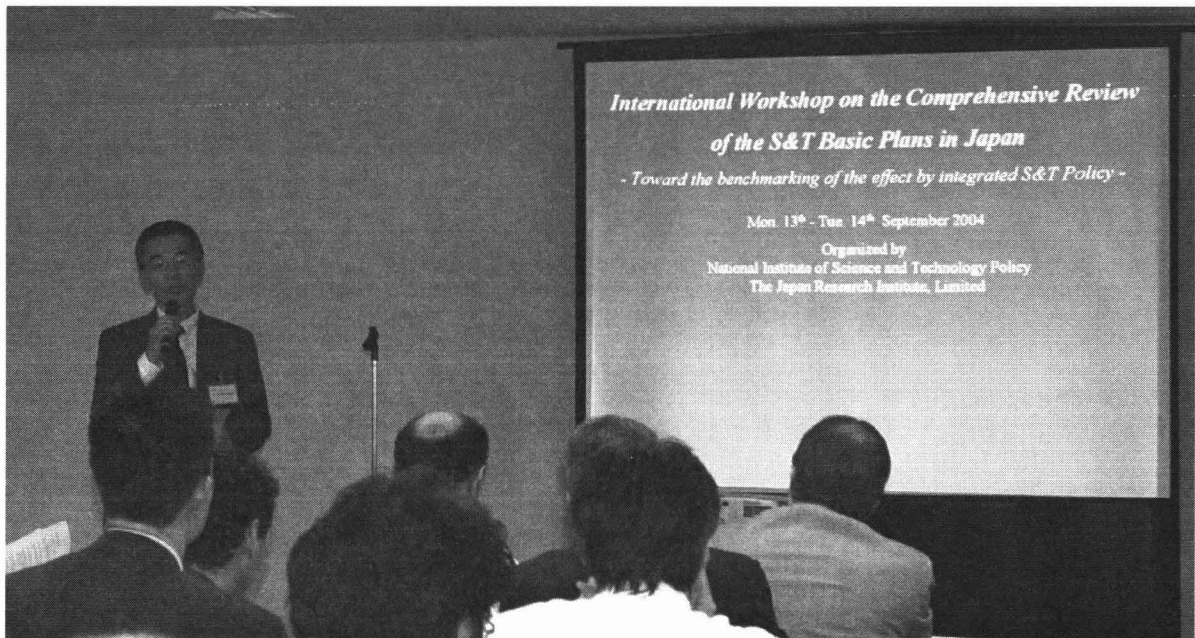
本ワークショップは、科学技術振興調整費事業の一環として開催したものです。

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国内外の主な招聘者の皆さん



永野所長 冒頭挨拶



討議風景 (セッション 1)



討議風景 (セッション 2)

はじめに

本ワークショップは、「基本計画の達成効果の評価のための調査」(基本計画レビュー調査)の一環として、本件調査の主要成果につき、国内外の科学技術政策の評価関係の主な専門家・有識者による国際的視点からのクロスチェック・確認を行うことを目的として、2004年9月13、14の両日開催された。

本ワークショップでは、我が国の科学技術基本計画の下で実施された公的施策・プログラムの進捗・達成効果について、海外主要国の施策展開との比較分析の観点から有意義な発表・討論が行われた。

特に、各政策領域にわたる世界の主要な「ベスト・プラクティス」の紹介に留まらず、各々の経済・社会システム及び文化的側面の差異も視野に入れ、各国の関連する取組みの問題点や教訓を他国の政策策定プロセスにインプリケーションとしてどう活かしていくか、という面からも、大いに参考とすべき情報、見解が得られた。

本ワークショップの全体会合における議論、並びに分科会レベルでのインプット・アウトプット分析及び科学技術人材、産学官連携・地域イノベーション関連の諸課題に係る討議を通じて、次期基本計画策定に向けての主要な問題の所在、その克服・解決に向けて取るべき施策の方向性も、一層鮮明に浮かび上がってきたものと考ええる。

今後本格化する我が国の次期基本計画策定に向けた審議・検討プロセスにおいて、こうした問題意識を踏まえ、国際的視野の下で客観的事実・データに立脚しつつ掘り下げた検討・考察が行われることが期待される。

更に、科学技術・イノベーション政策の中長期的方向性を検討する上で、今回のように国内外の関係専門家が各々の蓄積した経験・知見を持ち寄り、共通する諸課題について横断的議論を展開すると共に、グローバルな視野から自国の施策・プログラム展開の成果及び諸課題を見つめ直すことは極めて有意義である。今後こうした国際的な機会が関係国のイニシアティブにより改めて設けられることを期待したい。

本書においては、本ワークショップにおける発表・討議結果の概要を報告する。

末筆ながら、多忙なスケジュールの中、本ワークショップにご参画、貢献をいただいた国内外の専門家・有識者各位に対し、改めて心からの謝意を表したい。

2004年12月 科学技術政策研究所 第3調査研究グループ
総括上席研究官 斎藤 尚樹

「基本計画レビュー調査」国際比較分析アドバイザー検討会合構成

(五十音順)

板倉 周一郎 東京大学 生産技術研究所 教授
香月 祥太郎 鳥取環境大学 環境情報学部 教授
(現：立命館大学 情報理工学部 教授)
角南 篤 政策研究大学院大学 助教授
丹羽 富士雄 政策研究大学院大学 教授
林 隆之 大学評価・学位授与機構 評価研究部 助手
原山 優子 東北大学 大学院工学研究科 教授

上記委員各位には、計4回の検討会合（2004年4月5日、7月26日、9月3日、10月4日）において、本ワークショップの準備・結果取りまとめ段階におけるアドバイス、及び運営面でのサポートをいただいた。



原山 優子 教授（第2セッション座長）



榊 裕之 教授（第2セッション）



Steven Collins 助教授（第2セッション）



角南 篤 助教授（第3セッション座長）

「基本計画レビュー調査」国際ワークショップ開催結果概要

～ 統合的科学技术政策による効果のベンチマークに向けて ～

1. 趣旨・目的：

「基本計画レビュー調査」の主要成果につき、海外との比較分析結果等を参照しつつ、国内外の科学技術政策研究・評価関係の主な専門家・有識者による国際的視点からのクロスチェック・確認を行う。更に、これら専門家・有識者との討議を通じ、今後の我が国における関連政策展開へのインプリケーション、次期科学技術基本計画の策定プロセスにおける調査結果の活用のあり方につき検討・認識を深める。

2. 主催： 文部科学省 科学技術政策研究所、株式会社 日本総合研究所

3. 時期： 2004年9月13日（月）～ 14日（火）（2日間）

4. 会場： 三菱ビル 9F 964・965号会議室及び文部科学省 10F 第1・第2会議室

5. 参加者総数：99名

6. 国内外招聘者：

○ 海外（アルファベット順）

Dr. Pyengmu D. Bark	韓国科学技術評価・計画院国家科学技術計画・評価局長
Dr. William Blanpied	米ジョージメイソン大学客員上級研究員 (米 NSF 前東京事務所長、NISTEP 国際客員研究官)
Prof. Steven Collins	米ワシントン大ボセル校助教授
Prof. Luke Georghiou	英マンチェスター大学人文学部研究担当副学部長 兼工学・科学技術政策研究所理事（NISTEP 国際客員研究官）
Dr. Gerald Hane	Globalvation 代表（元 OSTP 国際局長代理）
Prof. Diana Hicks	米ジョージア工科大学公共政策学科教授・学科長
Prof. Christopher Hill	米ジョージメイソン大研究担当副学長代理 (Technology Policy International [TPI]理事)
Dr. Stefan Kuhlmann	独フラウンホーファ協会システム・イノベーション研究所 (FhG/ISI)副所長
Mr. Kei Koizumi	米 AAAS・R&D 予算・政策プログラム課長
Dr. Rongping Mu	中国科学院科技政策・管理科学研究所長
Dr. Ugur Muldur	EU 研究総局 A 局インパクト分析課長
Mr. Patrick Windham	米スタンフォード大学講師（TPI 理事）

○ 国内：(五十音順)

石田 寛人	科学技術振興機構 R&D 戦略センター首席フェロー(金沢学院大学長)
後藤 晃	東京大学先端科学技術研究センター教授 (基本計画レビュー調査推進委員会委員長)
榊 裕之	東京大学生産技術研究所教授
角南 篤	政策研究大学院大学助教授
丹羽 富士雄	政策研究大学院大学教授
林 隆之	大学評価・学位授与機構 評価研究部評価システム開発部門助手
原山 優子	東北大学大学院工学研究科技術社会システム専攻教授

7. 案内先

- ・政策当局；総合科学技術会議
- ・基本計画レビュー調査推進委員会
- ・関係機関；日本学術会議、関係学会(日本工学アカデミー、研究・技術計画学会)

8. プログラム (使用言語：英語、通訳なし)

第1日：9月13日(月)

オープニング セッション

開会挨拶 永野 博 科学技術政策研究所長
次期科学技術基本計画策定に向けた主要課題 薬師寺 泰蔵 内閣府・総合科学技術会議 議員(慶應義塾大学客員教授)
基本計画レビュー調査の主な結果 近藤 正幸 NISTEP 第2研究グループ客員総括主任研究官(横浜国立大学教授、基本計画レビューPT サブリーダー)
基本計画レビュー調査の主な結果に係るコメント・見解 Dr. William Blanpied 米ジョージメイソン大学客員上級研究員
基本計画レビュー調査の主な結果に係るコメント・見解 Dr. Stefan Kuhlmann 独 FhG/ISI 副所長

-----<パラレルセッション>-----

セッション1(a)(インプット・アウトプット分析)：予算(支出)分析

<セッションチェア：丹羽 富士雄 政策研究大学院大学教授>

(セッションチェア補佐：鈴木 達 NISTEP 第3調査研究グループ主幹研究員)

<ラポラトゥール：富澤 宏之 NISTEP 第2研究グループ主任研究官>

基本計画レビュー調査：第1期・2期基本計画期間中の科学技術予算分析 河村 憲子 ㈱三菱総合研究所 産業政策研究部研究員
日本の R&D 重点分野における米の財政援助及び米の重点 R&D 分野 Mr. Kei Koizumi 米 AAAS・R&D 予算・政策プログラム課長

欧州の R&D 政策：予算策定及び重点分野の展開 Dr. Ugur Muldur EU 研究総局 A 局インパクト分析課長
ディスカッション モデレーター：丹羽 富士雄 教授

セッション 1(b)(インプット・アウトプット分析)：R&D アウトプット分析(論文・特許)

基本計画レビュー調査：R&D アウトプットの定性的分析 富澤 宏之 NISTEP 第 2 研究グループ主任研究官
成長に係るベンチマーク分析：我々は違った方向へ向かっているのか？ Prof. Diana Hicks 米ジョージア工科大学公共政策学科教授・学科長
アウトプット分析に係るコメント：日本の論文発表傾向の状況 林 隆之 大学評価・学位授与機構 評価研究部評価システム開発部門助手
ディスカッション及び総括 モデレーター：丹羽 富士雄 教授

セッション 2(a)(主要政策領域の達成効果及び課題)：科学技術人材問題

<セッションチェア：原山 優子 東北大学大学院教授>

(セッションチェア補佐：植杉 紀子 NISTEP 第 3 調査研究グループ上席研究官)

<ラポラトゥール：金子 直哉 (株)日本総合研究所創発戦略センター上席主任研究員>

日本における科学技術人材の育成に係る分析 榊 裕之 東京大学生産技術研究所教授 阿部 浩一 NISTEP 第 1 調査研究グループ 上席研究官
米における R&D 重点化及び科学技術人材～日本への示唆 Prof. Christopher Hill 米ジョージメイソン大研究担当副学長代理
上記発表に係るコメント・見解 Prof. Luke Georgiou 英マンチェスター大学人文学部研究担当副学部長
ディスカッション モデレーター：原山 優子 教授

セッション 2(b)(主要政策領域の達成効果及び課題)：産学官連携・地域イノベーション

日本における産学官連携及び地域イノベーションの展開 斎藤 尚樹 NISTEP 第 3 調査研究グループ総括上席研究官
米国における産学官連携及び地域イノベーション Mr. Patrick Windham 米スタンフォード大学講師
産学連携・地域イノベーション促進への欧州／独の取組み及びその政策評価 Dr. Stefan Kuhlmann 独 FhG/ISI 副所長
上記発表に係るコメント・見解 Prof. Steven Collins 米ワシントン大ボセル校助教授
ディスカッション及び総括 モデレーター：原山 優子 教授

第2日：9月14日（火）

セッション3(各国政策のベンチマーク分析・インパクト評価)

＜セッションチェア兼ラポラトゥール：角南 篤 政策研究大学院大学助教授＞

海外施策動向とその達成成果に係るベンチマーク分析 佐久田 昌治 (株)日本総合研究所理事
ネオ・コンサーバティブな科学技術政策－公共政策、社会の責任、及び政治 Dr. Gerald Hane Globalvation 代表 (元 OSTP 国際局長代理)
次期欧州フレームワーク計画（2006年～2010年）に向けた伝統的・新しい手法 Dr. Ugur Muldur EU 研究総局 A 局インパクト分析課長
中国における科学技術政策の展開 Dr. Rongping Mu 中国科学院科技政策・管理科学研究所長
韓国の科学技術基本計画に基づく科学技術政策の主な展開と成果 Dr. Pyengmu D. Bark 韓国科学技術評価・計画院国家科学技術計画・評価局長
上記発表に係るコメント・見解 Dr. William Blanpied 米ジョージメイソン大学客員上級研究員
分科会討議概要に係る総括コメント 石田 寛人 科学技術振興機構 R&D 戦略センター首席フェロー
ディスカッション モデレーター：角南 篤 助教授

締め括り全体セッション

セッション1（インプット・アウトプット分析） 富澤 宏之 NISTEP 第2研究グループ主任研究官
セッション2（主要政策領域の達成効果） 金子 直哉 (株)日本総合研究所創発戦略センター上席主任研究員
セッション3（各国政策ベンチマーク分析・インパクト評価） 角南 篤 助教授
上記報告・政策的示唆に係るコメント・見解 Prof. Luke Georgiou 英マンチェスター大学人文学部研究担当副学部長
質疑応答、ディスカッション
総括コメント 後藤 晃 東京大学先端科学技術研究センター教授
閉会発言 平野 千博 NISTEP 総務研究官（基本計画レビューPT リーダー）

9. 個別セッションでの主な発表・討議内容

○冒頭全体セッション

- ・第1期・2期基本計画からの明確なポジティブ・メッセージ
 - －研究開発投資が大幅に増加
 - －基本計画期間中に「ハイレベル」のアウトプットが着実に増加
 - －国の科学技術システムの継続的改革が進展
- ・基本計画レビュー調査:画期的な評価研究
 - －日本と同規模の国では比類ない取組み
 - －多大な努力により重要な見識を抽出
- ・継続的改善による政策・評価の更なる課題追求

○セッション1(インプット・アウトプット分析)

<方法論的課題>

- ・1人当たり又は単位投資当たり論文・特許数の解析:「分母」の適正さに依存
 - －研究者数と大学への投資:過大評価の可能性
 - －「研究の生産性」:各分野の資本(設備)量に依存する多次元概念
 - －論文・特許の過剰生産を促す不健全なインセンティブとなる危険性
- ・「インプット」－「アウトプット」の混乱
 - (例)研究開発投資により育成された研究者数、競争的研究資金の獲得金額
- ・タイムラグの問題
 - －現在のアウトプットへの過去のインプット蓄積の寄与

<その他計測上の課題>

- ・各国間のシェアの分析・比較:急伸する東アジアを考慮に入れる必要
- ・絶対値での比較:他の重要なシステムの変化を見逃す可能性(例:米国における他分野を犠牲にした国防・国土安全保障への傾斜)
- ・競争的研究資金 vs. 外部資金の適切な計測

<インプリケーション>

- ・長期的視点からのより良いアプローチ:科学技術システムの容量・能力の測定
 - －人材、知識、インフラの蓄積・維持
- ・「インプット」－「アウトプット」－「アウトカム(インパクト)」の関係:これらを結びつける「モデル」の明確な理解が必要
 - －モデル自体がシステム改革により変化

○セッション2(a):科学技術人材問題

- ・科学技術人材は量的には増大:質的側面を検討する必要
- ・目的が柔軟性、流動性、開放性、多様性の達成ならば、労働力の弾力的活用(Casualisation)は正しい解決策か?
 - －現在の施策:教授等の上層でなく、それらの下層が対象

- －大学間競争により人材流動性も向上：自由な労働市場の具現化
- －流動性の主な障害：雇用、給料、労働条件、慣行
- ・教育訓練のニーズへの適合
 - －科学的専門化
 - －研究をマネージし、応用する広範な能力の醸成
- ・人材流動化の重要性
 - －産学官の間での知識移転(セクター間)
 - －学際分野への対応(科学分野間)
 - －グローバルな科学的ネットワークへの参画(国際間)
- ・システム全体を見据えたアプローチの必要性
 - －人口高齢化の下、初等教育から高等・生涯教育段階でのキャリア再養成までを含む

○セッション 2(b):産学官連携・地域イノベーション

<産学官連携>

- ・政策：形式的な側面に対応、測定可能な指標を測りがち
- ・現実の「連携」の4つの軸：
 - ①能力のある卒業生の流れ、②共同・契約研究、③知的所有権の商業化、④インフォーマルなネットワークと知識移転
- ・大多数の企業はこれまで①・④を利用：②・③に係る制度・ルールの整備含め、きめ細かい促進政策が必要
 - －米国の経験では「能力開発」が重要：起業家を育む周囲の人々、文化、環境の醸成
- ・商業化：主要な収入源とはなり得ない
- ・最終目標：ベンチャー企業、大学、政府研究所、仲介機関等が相互協力の下、明確な役割を果たす土台として大企業が存在する「生態系」を作ること

<地域イノベーション政策>

- ・中央政府と地方政府(及び国家間共同体)の間の権限・財源のバランス：国際的に大きな差異
- ・多段階の統治(governance)のマネジメント：イノベーション・システムの主要な側面
- ・地方も国際競争に参画、国際的ベンチマーキングにより利益を享受
- ・中央政府による「刺激」(impetus)の必要性
 - －地方による国立施設の誘致、活用方策
 - －公的・準公的研究機関の役割(中小企業への研究の橋渡し)
- ・クラスター形成への成功要素は何か？
 - －知識重視のクラスター vs. セクター別／商業クラスター
 - －目利き人材の明確なビジョンの必要性
 - －有効なネットワーク機能
 - －起業家を支えるインフラ

10. 全体総括(セッション 3・締め括り全体セッションでの発表・討議内容、英マンチェスター大学 Georghiou 教授の総括に基づく)

<重点化の方向性>

- ・重点4分野への研究資金シフト:論文は増加、特許は増加せず
- ・米国・EU:明示的な「重点化政策」なしに、これら分野へより集中
- ・重点化の方法論:「マトリクス」型アプローチへの移行の可能性
 - ータテ軸(科学技術分野)vs. ヨコ軸(社会経済目標)の格子点による重点分野整理の可能性
- ・社会経済目標に沿った重点分野の設定:政治的色彩の濃い作業
 - ー米国:マトリクス型アプローチが機能しない可能性
 - ーEU(フレームワーク・プログラム):現状はタテ・ヨコ混合型、将来的にはヨコ割りのアプローチの重要性が向上

<重点化のリスク>

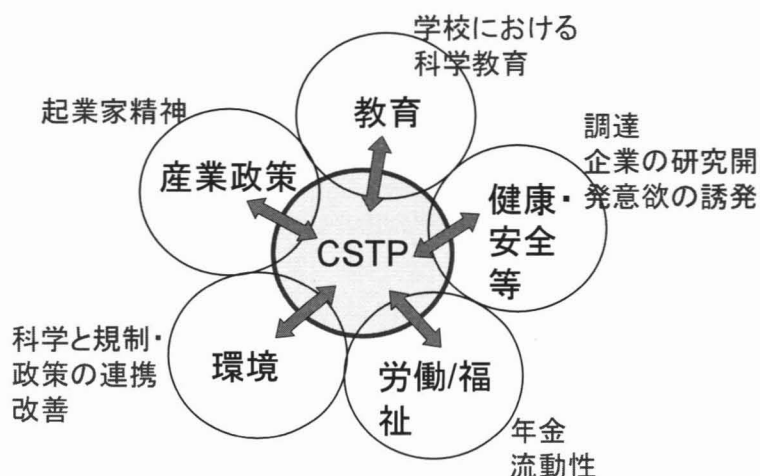
- ・「誤認」のリスク
 - ー各科学領域の重点分野・非重点分野への分類の誤認
 - ー「ラベルの張替え」の可能性
- ・相互依存の問題
 - ー重点分野は非重点分野(例:数学)に大きく依存する可能性
- ・行き過ぎた、又は過度に漠然とした重点化の懸念
 - ー関係当事者(ステイクホルダー)の圧力によるリソースの浪費
- ・国際間の重複
 - ー各国独自の必要性を十分考慮せず、国際的流行を追う傾向:全ての国・地域で同じ重点分野のリストを作成する懸念

<政策協調の枠組み整備>

- ・システム再構築及び基本計画の具体化により、CSTPを中核とする協調のとれた科学政策システムが実現



- ・第3期基本計画の課題:他の政策領域とのインターフェイスのマネジメントをどう進めるか



- ・過度の「政治のための科学」への懸念:政策形成プロセスにおけるトップダウン型機能(CSTPが中核)とボトムアップ型機能(例:アカデミー)のバランスも要検討

<大学の戦略>

- ・継続的進歩への主な障害:現在、組織内部に存在
- ・法制面からの改革:限界に近づく
 - 次のフェーズ:「組織内文化」の変革(運営環境の変化による触発を通じてのみ実現可能)
- ・起業家精神に富んだ大学がはっきり有利となり、一番に改革に乗り出した大学にモラルハザードが起こらないような環境の創出
- ・参加型(participative)プロセス(全レベルでの外部スタッフ登用等)による大学戦略プラン策定
- ・計画実施に係る予算とインセンティブの構築:実績(Performance)に対する報酬の付与

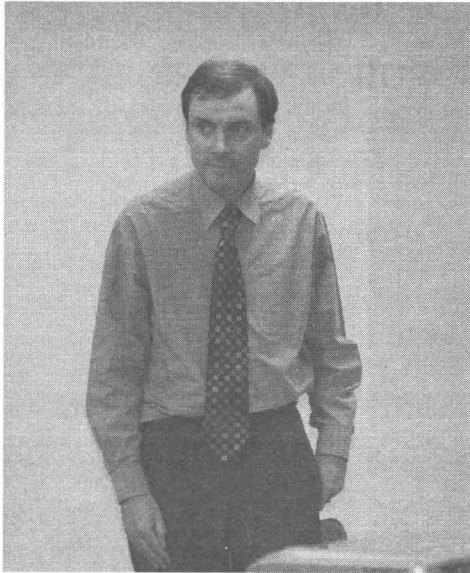
<政策手段の重点のシフト>

- ・現在の政策: リソースと機会を重視 → インセンティブ・能力の重視への移行が必要
- ・インセンティブ
 - ー全レベルで大学やプログラム・マネジメントから個々の研究者への流れ(cascade)を作る必要(例)研究・商業化面の成功の昇格・給料等への反映
 - ーシステムの多様性を保てるバランスのとれたインセンティブの必要性
- ・能力(Capabilities)
 - ー科学技術マネジメント:科学のトレーニングの必須要素
 - ーインターフェイスのプロフェッショナル化(TLOなど)

<次期基本計画策定に向けての示唆>

- ・各国に内在する文化・システムの明確でない特徴の差異により政策の「移転」(transfer)は困難
- ・科学技術政策:イノベーション政策の枠組みの下、他の全ての政策領域との明確なインターフェイスをもって策定する必要あり
- ・研究機関:戦略的能力を発展させ、「流れ」(cascade)のあるインセンティブの枠組みの下で運営する必要

- ・基本計画の(定量的レビューに続く)質的評価:各種「指標」を理解する上で極めて重要
- ・国際ベンチマーキング:評価の有用な枠組みを与えると共に、現実とは異なる以下のような事項の検討も必要
 - －「基本計画」不在を仮定した場合の影響の探索
 - －代替的アプローチ
- ・第 3 期基本計画の事前評価:システマ的アプローチの重視により、基本に立ち返って「合理性」(rationale)を要検討



Luke Georgiou 教授
(締め括り総括セッション)

海外招聘スピーカー発表内容ポイント

(※個々の発表内容に係るフルペーパー等は、科学技術政策研究所の和・英文ホームページ〈<http://www.nistep.go.jp>〉上で参照可能であるほか、別冊 Proceedings of International Workshop on the Comprehensive Review of the S&T Basic Plans in Japan に収録)

○ Kei Koizumi

米国の R&D 予算について解析した。米国ではバイオメディカル、国防、国土安全保障の予算増加で、結果的に R&D 予算の対 GDP 比が増加してきた。この予算を日本の重点分野と同じ枠組みで分類し、これら分野の米国での傾向を分析した。米国の R&D 予算はさまざまな制約から最重点分野の国防と国土安全保障さえ厳しくなると予想した。

○ Diana Hicks

科学技術のインプットおよびアウトプットの指標を用いて、米国およびアジア各国・地域を特に「成長」という観点から比較した。アジア各国・地域(中国、台湾、韓国、インド、シンガポールなど)の科学技術はアウトプットの面から見ても急速な成長があり、我々の注意を喚起した。また、アジア各国・地域では国際的な協力関係が進みつつあることも示した。日本の政策当局は今まで米国を常に意識してきたが、今後はアジアも視野に入れるべきとの見解を示した。

○ Christopher T. Hill

米国の R&D 重点化および科学技術人材について概括し、それに基づく日本の今後の政策展開への示唆について言及した。

米国の科学技術システムは柔軟、多様、開放的、流動的、競争的と捉えることができる。特に、人材流動性という観点では、年功序列ではなく、若くても能力のある人材が抜擢され、昇進すること、ランキングの低い大学学部を卒業しても、能力さえあればより高いランキングの大学院への道も開かれていること、異動に伴って年金などがポータブル(可搬型)であることを中心に、流動促進要素につき説明した。

日本の政策展開への示唆として、R&D 重点化については、分野を特定してしまうことにより、今後生まれる新しい分野への投資ができなくなり、新規参入への道を閉ざしてしまう可能性があることを指摘した。R&D ファンディングシステムについては、多様な資金源を確保する必要性を指摘した。また、米国ではライフサイエンス分野の R&D 投資の結果、Ph.D.が増え過ぎたがそれに見合う職がなく、ポスドク数を増やすことは必ずしも良いことではないと指摘したが、日本ではポスドク数が少ないので問題はまだ顕在化しないだろうとの認識を示した。

○ Patrick H. Windham

米国の産学連携と地域イノベーションにつき日本と比較しながら概括し、日本への政策展開への示唆について述べた。

産学連携を支援する政策については、日本版バイ・ドール法の制定などにより、米国と日本で似通ったものになってきた。世界市場との競争のため、企業は R&D ラボを削減しており、大学は企業の R&D ラボとして使われている。産学連携の成功のため、企業はライセンス契約などの交渉の際にユーザーフレンドリーな大学担当者を求めており、大学で柔軟な人事制度が行われることにより、より多くのベンチャー企業が生まれると指摘した。

地域イノベーションについては、日本では、大学発ベンチャー育成支援策、クラスター事業などにより政府が直接的に支援している。これに対し、米国では、中央政府は、地域への補助金といった形での直接的支援はしていないが、R&D 投資、ハイテク製品の政府調達といった形で間接的に支援をしており、地方政府は、インキュベータ、技術支援のほか、新しい企業を誘致し、起業家を支援している。ベスト・プラクティスの一つとして、社会的なインフラはないものの、起業家やベンチャーキャピタルにより成功したサンディエゴの例を取り上げ、起業家を支援する環境作りや、技術専門家・専門的マネージャーの育成の重要性を強調した。

○ Stefan Kuhlmann

欧州と独国における産学連携と地域イノベーションについて論じた。欧州には産学連携や地域イノベーションを促進する多くの政策があるが、依然として地域格差・不均衡が存在する。

欧州地域におけるイノベーション度合いを見る指標として、欧州特許庁への特許出願件数、公的 R&D 支出割合、企業の R&D 支出割合などを例示し、それぞれの指標毎のイノベーション先進地域を示した。地域イノベーション促進のためのプログラムとしてドイツのインルギオや、フラウンホーファ協会が地域予測プロジェクトの委託を受けているイタリアのトレントのプログラムなどを紹介した。

独国では、自国の政策の他に、欧州としてのいわば連邦政府的な政策があつて、日本との比較は難しいものの、独国では地方分権が進み、地方政府や地方産業がイノベーションに大きな役割を果たしていることから、日本でも地方の裁量を増やすことによりイノベーションが促進するのではないかとの見解を示した。

○ Gerald Hane

米国における科学技術政策について述べた。民主党政権から共和党政権への交代により、科学技術政策は非常に政治色が強くなった。例えば、気候変動、エネルギーといった政治色の強い分野は強化され、物理科学や科学技術人材といった政治的価値の少ない分野はあまり取組まれなくなった。OSTP (Office of Science and Technology Policy: 科学技術政策局) や NSTC (National Science and Technology Council: 国家科学技術委員会) の活動も縮小した。結果として、米国における科学技術の基盤が弱体化することが懸念される。

○ Ugur Muldur

EU での新しいインパクトアセスメントについて述べた。また、第 7 次フレームワークプログラム (FP) の策定準備についても言及した。

EU では他の各国と同様、知識経済社会に向けた体制作りを重視して、FP を実施している。第 7 次 FP では特に、技術面でのコラボレーションの推進と創造性の高い基礎研究の推進を新たな視点

として取り入れる方向である。インパクトアセスメントでは、科学技術イノベーションの経済的競争力向上への寄与を重視している。また、アセスメントの際には行政が過度に関与することなく、実施側が自由度を保てるよう配慮している。

○ Rongping Mu

現在構築中である中国の科学技術に係る政策及び法に関して述べた。

中国の中央政府で実施された科学技術イノベーションに係る政策は2002年末現在で500にもものぼる。このような中、特にここ20年間で科学技術政策と関連法のあり方については、①税務政策が科学技術イノベーション推進上、重要性を増している、②政府の役割は従来、R&D マネジメントであったが、科学技術を通じたマーケット創出及びそのための戦略立案に重点が置かれるようになってきた、という特徴が見られる。

このような背景から中国における科学技術政策は、「技術開発」よりも「市場開拓」を重視するなど、事業化、商業化ベースの視点から策定されるようになった。この結果、大学や研究機関との連携を背景に、企業の産業技術は急速に進歩し、科学技術イノベーションにおける企業の役割は重要度を増している。

今後は、政策立案が「トップデザイン」であるが故に生じている、政策の重複のモニタリング、政府省庁間の連携等の問題への対応等が必要である。

○ Pyengmu D. Bark

韓国における科学技術政策の展開と成果について述べた。

韓国では科学技術を重視した経済成長を目指して、科学技術基本法を改訂し、第二の科学技術立国、科学技術中心社会の構築等を標榜している。これを受け、最新の政策動向としては「次世代成長動力産業への注力」、「科学技術革新本部の新設」、「科学技術相の副総理への格上げ」等が実施されている。

< 英文プログラム >

International Workshop on the Comprehensive Review of the S&T Basic Plans in Japan

– Toward the benchmarking of the effect by integrated S&T Policy –

1. Date: Mon 13 – Tue 14 September 2004 (2 days)
2. Venue: Marunouchi, Tokyo (Plenary session and Working session 2, 3: External Conference Room, 9F #964-965, Mitsubishi Bldg. / Working session 1: MEXT Conference Room #1-2, 10F, MEXT Bldg.)
3. Participants: (99 persons in total)
(The invited participants other than presenters were Council for Science and Technology Policy (CSTP), members of NISTEP's Advisory Committee on the Review of the S&T Basic Plans, Science Council of Japan, The Engineering Academy of Japan, Japan Society for Science Policy and Research Management.)
4. Programme

Monday, 13 September

Opening plenary session

(Chair person: Mr. Naoki Saito, Director, 3rd Policy-Oriented Research Group, NISTEP)

Opening address

Mr. Hiroshi Nagano, Director-General, NISTEP

Issues and challenges for the next S&T Basic Plan

Prof. Taizo Yakushiji, CSTP member

Highlights of the comprehensive review of Japan's Science and Technology Basic Plans

Prof. Masayuki Kondo, Affiliated Senior Fellow and Leader, 2nd Theory-Oriented Research Group, NISTEP (Professor, Yokohama National University)

Achievements of the Science and Technology Basic Plans in Japan

Dr. William Blanpied, former Director, Tokyo Regional Office, NSF, US (International Affiliated Fellow, NISTEP)

Short comments on above presentations from the viewpoint of policy evaluation

Dr. Stefan Kuhlmann, Deputy Director, Fraunhofer Institute for Systems & Innovation Research (FhG/ISI), Germany

-----< Parallel working sessions >-----

Working session 1(a): Input / Output analysis: Budget (spending) analysis

<Session chair: Prof. Fujio Niwa, Professor, National Graduate Institute of Policy Studies
<GRIPS> (Senior Affiliated Fellow, NISTEP)>

<Rapporteur: Mr. Hiroyuki Tomizawa, Senior Research Fellow, 2nd Theory-Oriented Research Group, NISTEP>

Study for evaluating for achievements of the S&T Basic Plans in Japan: Government S&T budget analysis during the First and Second S&T Basic Plans <u>Ms. Noriko Kawamura</u> , Staff Researcher, Industrial Policy Department, Mitsubishi Research Institute, Inc. (MRI)
U.S. funding of Japanese priority R&D areas and U.S. priorities in R&D <u>Mr. Kei Koizumi</u> , Director, R&D Budget & Policy Programs, AAAS, US
European RTD policy: budgetary planning and evolution of the priorities <u>Dr. Ugur Muldur</u> , Head of Unit, Impact Analysis of Community Actions, Directorate A, DG Research, European Commission
Discussions Moderator: <u>Prof. Fujio Niwa</u>

Working session 1(b): Input / Output analysis: R&D output analysis (Papers & Patents)

Study for evaluating achievements of the S&T Basic Plans in Japan: Qualitative analysis of R&D Output <u>Mr. Hiroyuki Tomizawa</u> , Senior Research Fellow, 2 nd Theory-Oriented Research Group, NISTEP
Benchmarking Growth: Are we looking in the wrong direction? <u>Prof. Diana Hicks</u> , Professor and Chair, School of Public Policy, Georgia Institute of Technology, US
Comments & remarks on above presentations <u>Dr. Takayuki Hayashi</u> , Research Fellow, Evaluation System Division, Faculty of Univ. Evaluation & Research, National Institution for Academic Degrees (NIAD)
Discussions Moderator: <u>Prof. Fujio Niwa</u>
Concluding remarks for the working session <u>Prof. Fujio Niwa</u>

Working session 2(a): Achievements and issues in major policy areas: S&T personnel issues

<Session chair: Prof. Yuko Harayama, Professor, Graduate School of Engineering, Management of S&T Department (MOST), Tohoku University >

<Rapporteur: Mr. Naoya Kaneko, General Manager, Center for the Strategy of Emergence, JRI>

Analysis of Japanese trend on fostering human resource of science and technology <u>Prof. Hiroyuki Sakaki</u> , Professor, Institute of Industrial Science (IIS), University of Tokyo <u>Mr. Koichi Abe</u> , Senior Research Fellow, 1 st Policy-Oriented Research Group, NISTEP
Influences on the development of advanced students in science and technology <u>Prof. Christopher Hill</u> , Vice Provost for Research, George Mason University, US (Principal, Technology Policy International)
Comments & remarks on above presentations: <u>Prof. Luke Georghiou</u> , Professor of Science & Technology Policy and Management, Associate Dean of Research, Faculty of Humanities and Director of PREST, University of Manchester, UK
Discussions Moderator: <u>Prof. Yuko Harayama</u>

Working session 2(b): Achievements and issues in major policy areas: Industry-academia-government cooperation and regional innovation

The development of industry-academia-government cooperation and regional innovation in Japan <u>Mr. Naoki Saito</u> , Director, 3 rd Policy-Oriented Research Group, NISTEP
Best practice and key success factors in industry-academia-government cooperation and regional innovation in the US <u>Mr. Patrick Windham</u> , Principal, Technology Policy International, US (Lecturer, Stanford University)
European / German efforts and policy evaluation in facilitating industry- academia cooperation and regional innovation <u>Dr. Stefan Kuhlmann</u> , Deputy Director, FhG/ISI, Germany
Comments & remarks on above presentations <u>Prof. Steven Collins</u> , Associate Professor, University of Washington, Bothell, US
Discussions Moderator: <u>Prof. Yuko Harayama</u>
Concluding remarks for the working session <u>Prof. Yuko Harayama</u>

Tuesday, 14 September

Working session 3: Benchmarking & impact analysis: Major developments and achievements of S&T policy in selected countries

<Session chair and Rapporteur: Prof. Atsushi Sunami, Associate Professor, National Graduate Institute of Policy Studies <GRIPS> (Affiliated Fellow, NISTEP) >

Benchmarking analysis of overseas policy trends and its achievements <u>Dr. Masaharu Sakuta</u> , Research Director, The Japan Research Institute, Limited (JRI)

<p>Neo-conservative science and technology policy - Public policy, public responsibility and politics <u>Dr. Gerald Hane</u>, President, Globalvation, US (former Assistant Director for International Strategy and Affairs, OSTP)</p>
<p>Traditional and new tools and methods for the preparation of the next European Framework Programme (2006-2010) <u>Dr. Ugur Muldur</u>, Head of Unit, Impact Analysis of Community Actions, Directorate A, DG Research, European Commission</p>
<p>Major developments and achievements of S&T policy in China <u>Dr. Rongping Mu</u>, Executive Director-General and Professor, Institute of Policy & Management, Chinese Academy of Sciences (CAS), China</p>
<p>Major Developments and Achievements of Korea's S&T Policy <u>Dr. Pyengmu D. Bark</u>, Managing Director, Center for National Science & Technology Policy Planning, Korea Institute of S&T Evaluation and Planning (KISTEP), Korea</p>
<p>Comments & remarks on above presentations <u>Dr. William Blanpied</u>, former Director, Tokyo Regional Office, NSF, US</p>
<p>Comments & remarks for the working session <u>Mr. Hiroto Ishida</u>, Principal Fellow, Center for R&D Strategy (CRDS), Japan Science & Technology Agency (JST)</p>
<p>Discussions Moderator: <u>Prof. Atsushi Sunami</u></p>

Concluding plenary session (Chair person: Mr. Naoki Saito, Director, 3rd Policy-Oriented Research Group, NISTEP)

<p>Wrap up of the respective working sessions</p>
<p>Working session 1 (Input / Output analysis) <u>Mr. Hiroyuki Tomizawa</u>, NISTEP</p>
<p>Working session 2 (Achievements and issues in major policy areas) <u>Mr. Naoya Kaneko</u>, General Manager, Center for the Strategy of Emergence, JRI</p>
<p>Working session 3 (Benchmarking & impact analysis) <u>Prof. Atsushi Sunami</u>, GRIPS</p>
<p>Comments & remarks on above reports and their policy implications <u>Prof. Luke Georghiou</u>, Associate Dean of Research, Faculty of Humanities and Director of PREST, University of Manchester, UK</p>
<p>Discussions</p>
<p>Concluding remarks for the workshop <u>Prof. Akira Goto</u>, Professor, Research Center for Advanced S&T, University of Tokyo [Chair, Advisory Committee for the NISTEP review on S&T Basic Plans]</p>
<p>Closing remarks <u>Mr. Yukihiro Hirano</u>, Deputy Director-General, NISTEP [Leader, NISTEP Project Team for the review on S&T Basic Plans]</p>

締め括り総括セッションでの発表資料
(英マンチェスター大学 Georghiou 教授作成)

International Workshop on The Comprehensive Review of the S&T Basic Plans in Japan

Comments for Concluding Plenary Session
Luke Georghiou

1

Taking stock

- Clear positive message from Basic Plans
 - Steady increase “high level” outputs in period of 1st and 2nd Plans
 - Dramatically expanded R&D investment
 - Continued reform of national S&T systems
- Landmark evaluation study
 - Nothing comparable for a country this size
 - Huge effort – important insights emerging
- In spirit of continuous improvement look for further lessons for policy and evaluation

2

Methodological Aspects of Input-Output Approach

- Per capita or per unit figures for publications & patents rely on correct denominator
 - May be over-estimate of researchers numbers and university investment
 - In any case “research productivity” is multi-dimensional concept depending upon capital (equipment) intensity of field etc
 - Danger of perverse incentives to overproduce
- Confusion of inputs and outputs
 - Numbers of researchers fostered through R&D investment
 - Acquired amount of competitive research funds
- Time lag – today’s outputs from accumulation of previous inputs

3

Other measurement issues

- International shares and comparisons need to take account of broadening East Asian capabilities
- Absolute amounts can miss important changes in other systems eg US skewing to defence and homeland security at expense of other fields
- Proper measure of competitive vs external funds

4

Implications

- Better approach in long run is to measure capacity and capabilities of the S&T system
 - Accumulation and maintenance of human resources, knowledge and infrastructure
- Input-output-outcome/impact relationships need clear understanding of model that links them
 - This model itself being transformed by reforms

5

S&T Personnel

- Achievement in numbers is positive but ...
- If desire is to achieve flexibility, mobility, openness and diversity, is casualisation of the workforce the right solution?
 - Present policy acts not on the rigid layers but on those underneath them
 - Competition among universities can also drive mobility – natural labour market
 - Presentation made clear that main barriers lie in employment, salary, working conditions and practices
- Matching training to need
 - By scientific specialisation
 - By broader capabilities to manage and apply research
- Mobility is key for
 - Knowledge transfer academia-industry-government
 - Interdisciplinarity
 - Participation in global scientific networks
- Need for whole system approach
 - Primary education to mid/late career retraining in situation of ageing population

6

Industry-academia-government cooperation

- Tendency for policy to address more formal aspects and to measure the measurable
- In practice linkages have 4 dimensions:
 - Flow of trained graduates (firms say most important)
 - Collaborative and contract research
 - Commercialisation of IPR
 - Informal networking and knowledge transfer
- First and last reach greatest number of companies but need more subtle policies to promote
 - US experience shows capacity building – people and culture/environment friendly to entrepreneurs
- Commercialisation can never be major income source
- Ultimate aim is ecology in which large firms act as base around which start-ups, universities, government labs, intermediaries etc are in well-defined mutually supportive roles

7

Regional innovation policy

- Substantial international variation in balance of power & resources between national and regional governments (and supra-national)
- Managing multi-level governance now a key aspect of innovation systems
- Regions also engage in international competition and benefit from international benchmarking
- Need for central government impetus
 - How can a region attract/make use of national facilities
 - Role of public and semi-public laboratories as bridges from research to SMEs
- What are success factors in cluster formation?
 - Knowledge versus sectoral or trading clusters
 - Need for clear vision of technology leaders
 - Effective networking functions
 - Supportive infrastructure for entrepreneurs

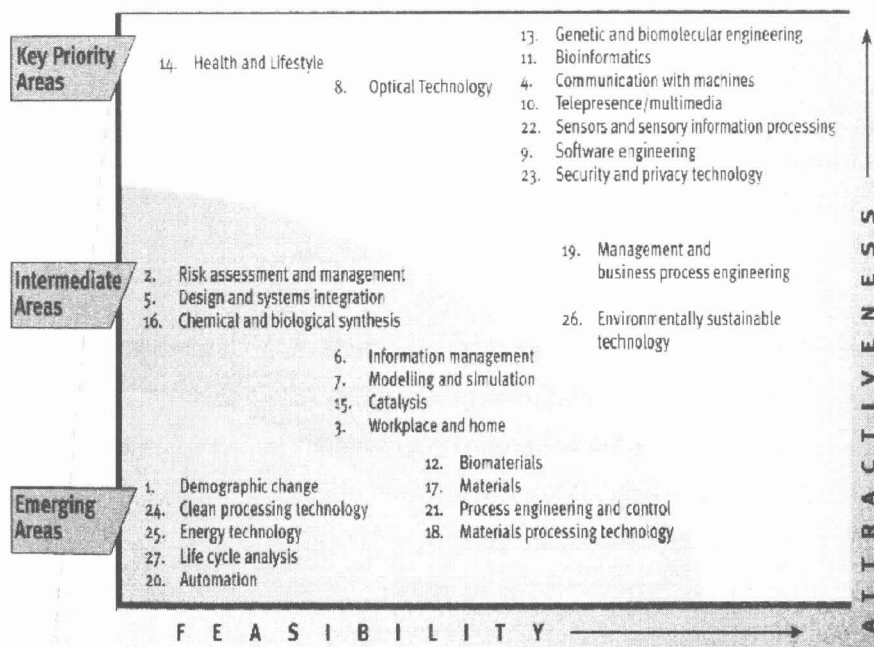
8

Prioritisation

- Note shift of resources to 4 priorities and increase in papers but not patents
- However, workshop shown both USA and EU more concentrated in these areas without explicit prioritisation policies
- How to prioritise?
- Vertical/Horizontal intersection proposed in table document
- Could move to explicit matrix approach cf 1st UK Foresight Programme
 - attractiveness/feasibility
 - however does not solve basic problems of prioritisation

9

Similar to 1st UK Foresight Programme Framework



10

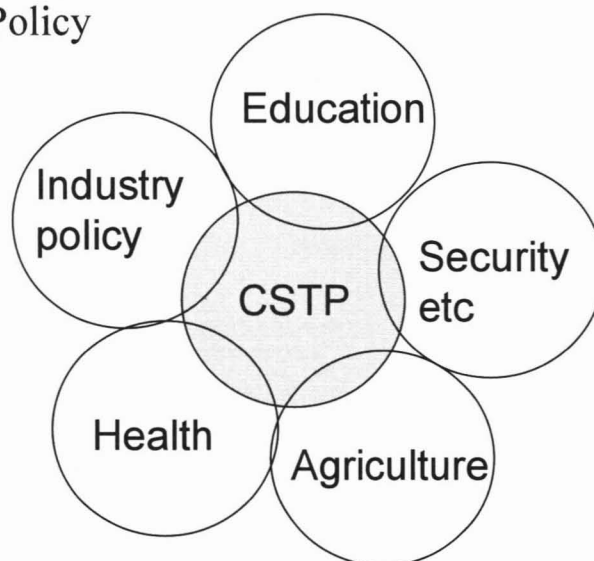
Risks of prioritisation

- Mis-identification
 - Which science falls under priority and which does not
 - Relabelling a possibility
- Inter-connection
 - Priority field may be heavily dependent upon field not explicitly prioritised eg mathematics
- Excessive or too general priorities
 - Stakeholder pressures mean resources dissipated
- Duplication
 - Tendency to follow international fashion rather than to consider in depth specific national needs leads to same list in all countries and regions

11

Conclusions – Policy coordination

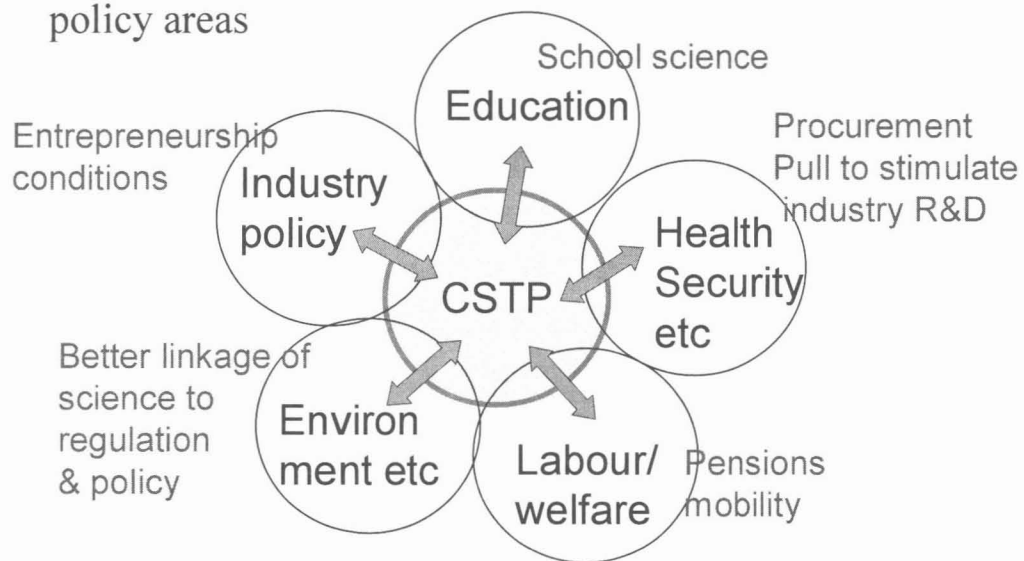
Restructuring and Basic Plan Created Coordinated Science Policy



12

Conclusions – Policy coordination

Challenge for 3rd Plan to manage interface with other policy areas



13

University strategy

- Major barriers to continued progress now appear to lie inside institutions
- Approaching limit of reform possible through legislation
- Next phase will involve changes in organisational culture that can only come from within stimulated by changes to operating environment
- Create environment in which entrepreneurial universities have clear advantages so no moral hazard to be first to reform
- University strategic plan formation to be participative process with staff buy-in at all levels
- Build budgets and incentives around plan and reward against performance

14

Shifting emphasis

- Current policy emphasises resources and opportunities
- Need to shift emphasis to incentives and capabilities
- Incentives
 - Need to cascade from university and programme management to individual researchers at all levels
 - Eg success in research or commercialisation reflected in promotion, salary etc
 - Must be balanced incentives to ensure variety in system
- Capabilities
 - Management of S&T an integral part of scientific training
 - Professionalisation of interfaces (TLOs etc)

15

Conclusions

- Policy transfer is difficult because of embedded cultural and systemic features which may not be obvious
- S&T Policy needs to be set in framework of innovation policy and with clear interface to all other policy domains
- Research institutions must develop strategic capabilities and operate in cascaded incentive framework
- Second qualitative stage of Basic Plan evaluation very important to understand indicators
- International benchmarking provides one useful framework for evaluation but also a need for counterfactual
 - Exploration of effect of “no basic plan” hypothetical on Japan
 - Alternative approaches
- Ex ante evaluation of 3rd Basic Plan could revisit issues of rationale with emphasis on systemic approach

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＜各スピーカー発表要旨＞

***International Workshop on the Comprehensive Review
of the S&T Basic Plans in Japan***

— Toward the benchmarking of the effect by integrated S&T Policy —

September 13-14, 2004
Marunouchi, Tokyo, Japan

Abstracts

*Organized by
National Institute of Science and Technology Policy
&
The Japan Research Institute, Limited*

Highlights of the Comprehensive Review of Japan's Science and Technology Basic Plans

Masayuki Kondo

Affiliated Senior Fellow and Leader, 2nd Theory-Oriented Research Group, NISTEP
(Professor, Yokohama National University)

The presentation will highlight some finding from reviewing the First and Second Science and Technology (S&T) Plans. The findings will be presented in three categories: input (budget), output (research papers and patents) and some policy topics.

Input:

- * Japan's S&T budget increased more largely than its GDP and total government budget.
- * Japan narrowed the difference of S&T budget with the United States during the First S&T Plan period, but recently the United States is increasing its S&T budget aggressively to widen the gap with Japan.
- * Japan increased basic research budget; and the United States strengthened basic research to a greater extent than Japan.
- * Competitive research funds increased without decreasing non-competitive funds in Japan. However, it will be difficult to double the size of competitive funds during the Second S&T Basic Plan as planned.
- * Research facilities and intellectual infrastructure have basically been constructed planned in Japan.
- * Japan's R&D budgets of four priority areas increased. The four priority areas are a) life science, b) ICT, c) environment S&T and d) nanotechnology and material science.

Output:

- * Japan's research papers have enhanced performance in quantity and quality. They have also shown positive results in the priority areas
- * Japan's patents have shown qualitative improvement, but quantitative improvement has lagged.

Some Policy Topics:

- * In human resource development, the number of post-doctorate researchers has achieved the quantitative goal of 10,000, but many problems remain in support measures and career paths. A fixed-term employment system has been introduced in many organizations to improve researcher mobility, but only a limited number of researchers have been hired as fixed-term researchers.
- * In industry-academia-government collaboration, the number of joint research between universities and the industry increased, and the number of university spin-offs showed an upsurge, particularly in the four priority areas.
- * In regional innovation, both the national government and local governments have shown great efforts.
- * To study the contribution of S&T to the economy, society, and people's life, six case studies were carried out up to now. The study has found that the contribution of past public supports was large in supercomputer development. Additional 26 case studies are being carried out successively this year.

Achievements of the Science and Technology Basic Plans in Japan: Impressions of a Sympathetic Foreigner

William A. Blanpied

Former Director, Tokyo Regional Office, NSF, US
(International Affiliated Fellow, NISTEP)

The First and Second Science and Technology (S&T) Basic Plans (1996-2001 and 2001-2006), developed in response to the 1995 Science and Technology Basic Law, have significantly altered the science and technology enterprise in Japan, not only substantively but also in the ways that Japanese (and foreign) scientists think about the enterprise. Although there are some continuities between the two plans, they also differ in their objectives. Whereas the First Plan sought to expand the enterprise, the Second Plan also aimed at its reorientation. The Second Plan has also served as a partial agenda for the Council for Science and Technology Policy (CSTP), created at the time of the reorganization of the Government of Japan in January 2001. Additional, complementary measures have also contributed to changes in the science and technology enterprise. Quantitative assessments of the impacts of the two plans and related measures by NISTEP and its contractors should provide essential inputs into formulation of the Third Basic Plan.

Study for Evaluating the Achievements on the S&T Basic Plan in Japan: Government S&T Budget Analysis during the First and Second S&T Basic Plans

Noriko Kawamura

Staff Researcher, Industrial Policy Department, Mitsubishi Research Institute, Inc.

In considering the following Basic Plan measures at this time in the fourth year of the Second Basic Plan, a determination of the situation with respect to the interim effects attributable to the Basic Plans is required.

In this presentation, the state of fulfillment of the Basic Plans will be analyzed by focusing on budgetary science- and technology-related expenditures as pertains to research and development by the Japanese government and by grasping the situation concerning allocations and disbursements as pertains to the main focused goals in the Basic Plans.

The core of the presentation will deal with the following points:

1. How is S&T budget in Japan changing?
→S&T budget by the national government is increasing, whereas by local government is decreasing.
2. Into what kinds of areas are science- and technology-related funds invested?
→Allocation by ways of purpose to use and by types of institutions, etc.
3. How is the allocation of R&D-related budget to the basic research changing?
→Increasing of basic research ratio.
4. How is the allocation of R&D-related budget to the four prioritized areas changing?
→Advancement in the narrowing of the focus.
5. How are competitive research funds changing?
→Rapid growth occurred during the execution of the First Plan and sluggish growth can be seen during the execution of the Second Plan.

U.S. Funding of Japanese Priority R&D Areas, and U.S. Priorities in R&D

Kei Koizumi

Director, R&D Budget & Policy Programs, AAAS, US

U.S. federal government funding of R&D has expanded dramatically this decade, totaling a projected \$571 billion from 2001-2005, because of large budget increases for biomedical research, national defense, and homeland security. Increases in these areas have resulted in the U.S. government R&D/GDP ratio increasing during this decade after decades of decline. The paper examines trends in U.S. federal R&D investments in the four Japanese priority areas of life sciences, information technology, nanotechnology and materials, and environmental S&T over the past decade, along with trends in investments in four other focus areas. The paper also examines prospects for future U.S. investments in these areas and in overall federal support of R&D as revealed in congressional authorizations and in analyses of the latest U.S. budget projections to 2009. All indications are that U.S. federal investments in the second half of the decade will be severely constrained by other commitments and the U.S. budget deficit, and that even the high priority areas of national defense and homeland security will face harsh competition for resources. In examining basic research, especially competitively awarded research grants, the paper finds that past budget growth has stalled and could decline in the future, although a policy commitment to competitive awards and basic research will continue. Finally, the paper examines emerging or new priority areas for U.S. R&D funding, including homeland security with particular attention to biodefense, a renewed focus on high-performance computing, and hydrogen energy and related technologies.

Study for Evaluating the Achievements on the S&T Basic Plan in Japan: Qualitative Analysis of R&D Output

Hiroyuki Tomizawa

Senior Research Fellow, 2nd Theory-Oriented Research Group, NISTEP

The purpose of this study is to statistically and systematically grasp R&D activities under the Science and Technology Basic Plans in terms of R&D output.

For this purpose, we analyzed the quantitative transition of scientific papers and patents produced by Japanese research institutes, universities, and business enterprises during the S&T Basic Plan Terms (1996–2000 and 2001–2005) and pre-Basic Plan Term. We also analyzed the qualitative change of Japanese R&D output, taking into account citation frequency of scientific papers and patents. Furthermore, we illustrated the influence of the S&T Basic Plans on Japanese R&D system by focusing the structural change.

This presentation reviews the major findings of first-year research, specifically as follows;

- (1) Macro-analysis of scientific paper production in Japan under the Basic Plans
- (2) Scientific paper production in 8 priority areas
- (3) Transition of scientific paper production by research field and growth pattern
- (4) Transition of number of scientific papers by citation frequency rank
- (5) Number of scientific papers by industrial/academic/governmental sector
- (6) Change of science co-author structure in Japan
- (7) Global trend of patent application
- (8) Patents in 8 priority areas (analysis of US patent data)
- (9) Macro-analysis of growth areas in US patent
- (10) Analysis of linkage between scientific papers and patents

Finally, issues for the second-year examination and future discussion are also presented.

Benchmarking Growth: Are we looking in the wrong direction?

Diana Hicks

Professor and Chair, School of Public Policy, Georgia Institute of Technology, US

The NISTEP analysis of R&D outputs in the international context exemplifies bringing methodologically rigorous output analysis to bear on assessing policy outcomes. It is a model of clarity that others would do well to follow. Like Japan, many countries assess their performance in relation to trends in US output, which leaves the question: against whom should the U.S. compare itself? I will argue that U.S. policy makers would benefit from looking at indicators of growth in output. As a mature system, U.S. output, like Japanese output, is much larger than that of many countries and is also relatively stable. The talk will put some of the NISTEP output indicators into another context to point out that there are a set of extremely dynamic emerging players on the S&T scene. In this talk I will benchmark U.S. and Japanese growth against the dynamic players and discuss policy implications.

Analysis of Japanese Trends for Better Cultivating of Human Resources in Science and Technology (HRST)

Hiroyuki Sakaki* and Koichi Abe**

*Professor, Institute of Industrial Science (IIS), University of Tokyo

**Senior Research Fellow, 1st Policy-Oriented Research Group, NISTEP

Throughout the 1st and 2nd Science and Technology (S&T) Basic Plans of Japan (1996-'00/'01-'05), the policy for “Fostering and Securing of Human Resources in Science and Technology (HRST)” has been regarded as one of the most important subjects to be tackled with the first priority. In fact, as a consequence of this policy, Japanese systems for cultivating HRST have been greatly strengthened, resulting in, for example, the substantial increase of post-doctorates (in excess of 10,000, as of 2003).

From now on, it is vital to set up and promote a policy so that these advanced human resources (doctorate recipients including post-doctorates) are surely employed and amply utilized in various forms of professions and employment sectors. The recent survey by MEXT in 2003 has clarified, however, that the employment sectors of doctorate recipients in Japan are still dominated by universities and other academic institutions, while the percentage of doctorate recipients employed by industrial sectors is lower in Japan than that in U.S by 17 points. These facts clearly indicate the need for prompt and effective actions to be taken for the better balance and increased diversity both in employment and job search processes.

Hence, in the process of drawing up the 3rd S&T Basic Plan, it is critical to investigate actual conditions of HRST in Japan, and to make a set of policies to widen both the career paths and the employment sectors for doctorate recipients.

In this presentation, we report on our recent questionnaire-survey which were conducted on researchers and administrators in academic institutions and industry and clarify “actual conditions of Japanese HRST”. In addition, we describe our bench-marking studies to clarify distinctive features of present situations in Japan with respect to other countries, and discuss key points for “diversifying occupational opportunities and employment sectors for advanced HRST in Japan”.

Influences on the Development of Advanced Students in Science and Technology

Christopher T. Hill

Vice Provost for Research, George Mason University, US
(Principal, Technology Policy International)

It is recognized around the world that training graduate students for research careers has a great deal in common with traditional master-apprentice relationships, in which the formation of students is heavily influenced by personal relationships with senior professors and other mentors. However, certain systemic factors also influence the development of advanced students. This paper will examine a few such factors, such as modalities of financing of advanced education, influence of immigration rules and international students generally, opportunities for internships in industry and government laboratories, publishing expectations, and even examination practices. Reflections on cross-national differences will be offered where possible.

The Development of Industry-Academia-Government Cooperation and Regional Innovation in Japan

Naoki Saito

Director, 3rd Policy-Oriented Research Group, NISTEP

This presentation reviews the developments of industry-academia-government cooperation and regional innovation in Japan.

The current situation of industry-academia-government cooperation is characterized by the following three:

- a. Increasing number of joint-papers by industry and academia,
- b. Increasing number of patents after establishments of TLOs,
- c. Drastic rise of university-initiated start-up companies.

However, comparison with the US and the UK shows that Japan is still lagging behind.

In order to promote regional innovation in Japan, both the central and local governments have implemented policy packages including budget allocations and setting up dedicated offices, conferences, advisory boards, and general principles. A composite indicator system measuring regional S&T activities toward innovation is being developed. We reviewed some of the results by using this indicator to evaluate the current status.

Finally, policy implications derived from the above considerations are also presented.

Best Practices and Key Success Factors in Industry-Academia- Government Cooperation and Regional Innovation in the U.S.

Patrick Windham

Principal, Technology Policy International, US (Lecturer, Stanford University)

Both the United States and Japan have government programs to encourage industry-university research and technology transfer. For example, the U.S. supports university-industry engineering research centers and uses the Bayh-Dole Act to encourage the transfer of university research to companies. Japan has similar policies.

However, in a related policy area – the promotion of regional innovation and growth – the U.S. and Japanese governments take different approaches. In Japan, the national government plays an important role, through such programs as Venture Business Laboratories and incubation facilities. The U.S. federal government has very few programs directly aimed at promoting regional innovation. Instead, the federal government contributes to regional economic growth *indirectly*, by supporting R&D at universities, companies, and federal laboratories; by buying high-tech products (and thus contributing to the demand for innovative products); and by maintaining tax laws, intellectual property rules, and other policies that encourage and reward entrepreneurship. Many state governments and local civic organizations seek to build on federally-funded R&D capabilities in their regions, in the hope that they can encourage the creation and growth of high-tech clusters. Some regions in the U.S. succeed better than others. The experience of San Diego, California, illustrates some best practices and key success factors in U.S. regional innovation.

European / German efforts and policy evaluation in facilitating industry-academia cooperation and regional innovation

Stefan Kuhlmann

Deputy Director of the Fraunhofer Institute for Systems and Innovation Research, Germany

Generally in Europe, as well as in Germany, we are witnessing an increase of public efforts aiming at establishing and strengthening regional research and innovation capacities, supposed to be a basis for sustainable economic growth. Also, policies are designed to mitigate regional disparities in innovation and economic performance, within countries and across Europe. Related policies are initiated and run by national governments and the European Commission; at the same time there are considerable and increasing endogenous efforts by regional authorities.

The presentation discusses a few of policy examples and related evaluation efforts (if in place): (1) The Regional Innovation and Technology Transfer Strategies and Infrastructure (RITTS), a programme of the European Commission; (2) the German "Innoregio" programme; (3) measures fostering public research-industry collaboration in the German federal state ("Land") of Baden-Württemberg; (4) a regional foresight initiative in the Italian autonomous region of Trento.

The presentation concludes:

- There are ample public policies facilitating industry-academia cooperation and regional innovation in Europe.
- The provision of public initiatives – offered by national governments, regional authorities, and European Commission – is sometimes complex and not transparent for regional actors, and even contradicting in targets.
- In spite of such efforts there are still serious and partly growing regional disparities in innovation performance and growth, across nations and Europe.
- Increasingly regions are challenged by global competition: there is a need for the development of internationally attractive and unique research and innovation profiles, as a basis for sustainable economic growth.
- So far there we find no systematic, but complex and partly intransparent, though improving policy evaluation practice in the "old EU", which has partly been stimulated by European Commission's requirements. The new EU member states move up on the learning curve.
- Strategic regional policymaking aiming at internationally attractive and unique research and innovation profiles would combine policy evaluation with foresight exercises.

Benchmarking analysis of overseas policy trends and its achievements

～from the view point of Japan's national innovation～

Masaharu Sakuta

Research Director, The Japan Research Institute, Limited

The 1st and 2nd S&T Basic Plans expanded national S&T budgets and accelerated R&D activity in Japan. Alongside the continued budget increase in the latter half of the 1990s, the Japanese economy fell into the doldrums and remained sluggish until 2003.

Many express concern over a weak linkage between overall R&D activation and our economic strength. One of main factors is a lack of necessary mechanism which utilizes S&T research results in the industry. Based on this observation, we conducted a benchmarking analysis of S&T policies in US, EU, UK, Germany, Sweden, Finland, China and South Korea. Basic survey items are as follows:

- Goal-setting of S&T policy
- S&T related organizations
- Recent trends in S&T policy
- Strategies for R&D prioritization
- Programs for the industry-academia-government cooperation
- Fostering and securing S&T human resources
- Supporting system for regional innovation (policies for developing regional clusters)
- Mechanism for decision-making and S&T budget distribution system
- System for policy review

As a result, we identified the following as the most pressing issues that Japan must address:

- (1) Efforts to identify innovation as cornerstones of both technology policy and economic policy and build consensus in the society
- (2) Exploration of persuasive logics for R&D prioritization aiming at achieving the nation's goal, based upon quantitative approach
- (3) Extended goal-setting for the balance between basic appropriation and external funding for the university and public research institute (integration of external funding from overseas and from industry)
- (4) S&T related personnel fostering, placing emphasis on improving the practical skills of Ph.D. students and post-doctoral researcher (as a principal investigator) and human resource mobility
- (5) Promotion of 'sustainable' regional innovations through adequate role-sharing of central government and local community, as an effective process for bridging S&T activities in the region and the revitalization of regional industry and economy
- (6) Role definition of public research institutes in the industry-academia-government cooperation

Neo-Conservative Science and Technology Policy - Public policy, Public responsibility and Politics

Gerald Hane

President, Globalvation, US

Science and technology policy in the government of the United States has traditionally been an area less subject to partisan politics than other areas of public policy. The ability to steer a course based on merit of scientific knowledge has been a foundation of the government's contributions to the advance of science and technology and its contributions to society.

Yet as science and technology advance and integrate into many facets of modern society, so too does the temptation to bend the course and conduct of science and technology to serve political purposes. The U.S. government's approach to science and technology policy has taken a significant shift in the past four years: "science for politics" has emerged as a dominant theme. This use of science for political ends reflects the enhanced role of science to strengthen political power and ideology, a form of *Neo-Conservative Science and Technology Policy*.

High priority issues in science and technology policy that reflect this paradigm are discussed in this paper and include climate change, the hydrogen economy, stem cells, and ballistic missile defense.

These changes in the science and technology policy paradigm provide an opportunity to view not just a changing approach to issues, but also the interaction of higher level policy shifts with the infrastructure and practices of science and technology. A politically driven approach may lead to less attention given to non-political yet still important issues in science and technology policy such as scientific advice, the physical science base, and the S&T human resources.

In recent years, research evaluation has also been rising in visibility and importance. One question is whether the rising use of program evaluation will improve the performance of government science and technology programs, or whether such methods will also be used for political goals. Early evidence indicates that evaluations are proving effective in improving administration, but not in influencing policy. Although there was initial concern that growing evaluations might intrude on the effective management of government research by emphasizing "what can be measured" rather than "what should be evaluated," the new systems might help to protect valuable parts of the infrastructure, such as merit review, from political intrusion.

Traditional and new tools and methods for the preparation of the next European Framework Programme (2006-2010)

Ugur Muldur

Head of Unit, Impact Analysis of Community Actions,
Directorate A, DG Research, European Commission

Like other major world economies, Europe is facing the challenge of making the transition into the knowledge-based economy. Ever since the 2000 Lisbon European Council, and the formulation of the so-called Lisbon objectives (later complemented by the so-called Barcelona objectives), Europe has accelerated its efforts towards the achievement of that goal. Within that context, the European Commission is currently implementing, for the sixth time already, a so-called framework programme, its major policy tool, and already preparing for the Seventh Framework Programme. Thus the purpose of this paper/presentation will be to discuss – while comparing as much as possible with the Japanese experience, and aiming as much as possible to draw lessons for Japan - some or all of the below :

- The main challenges facing Europe, both more generally in terms of economic competitiveness and more specifically in terms of science, technology and innovation.
- The European experience in terms of S&T benchmarking to better understand the S&T policy challenges Europe is facing and the policies towards addressing them.
- Recent policies that have been instituted to face those challenges, so the main horizontal and thematic priorities of the Sixth and Seventh Framework Programmes.
- The recent European experience in terms of extended impact assessment of major research programmes, both ex ante and ex post.

Development on S&T Policy in China

Prof. Rongping Mu

Institute of Policy and Management Chinese Academy of Sciences

This presentation reviews S&T policy in China as follows;

- Quantitative Analysis on the S&T policy & Law in China
 1. Changing the Role of Policies and Laws for S&T
 2. Function Extension of the S&T Policy and Laws
- Effectiveness of S&T Policy and Law
 1. Promoting the Reform of the S&T System
 2. Promoting the Integration of the S&T & the Economy
 3. Building the S&T Capability
- Problems in Building Environment of S&T Policy & Law
 1. Lacking of Monitoring System, of Top-design for S&T Policy
 2. Lacking Effective Support of S&T Policy for National Innovation System
 3. Lacking Effective S&T Support for Social & Economic Development
- Future Policy & Law System for S&T in Discussion
 1. The Goal of Building S&T Policy & Law System of China
 2. To Make the “Basic Law for Science and Technology”
 3. To Increase the National Decision-making Level for S& T
 4. To make “The National Strategy for IPR”
 5. To make the statute for Sharing S&T Resources
 6. To Make the Statute for Regional Innovation
 7. To Strengthen the Integration of National S&T Resources
 8. To Ensure the National Security & Sustainable Development

Major Developments and Achievements of Korea's S&T Policy - Focused on S&T Basic Plans -

Pyengmu D. Bark

Director General, Division of National Science and Technology Planning and R&D Program Evaluation, Korea Institute of S&T Evaluation and Planning (KISTEP), Korea

- Since 1999, the S&T policy making mechanism in Korea has been more focused and centrally controlled with some massive and intensive government effort.
- 1999 is the year that the National Science and Technology Council (NSTC) was established and chaired by the President of Korea. First year of full scale national evaluation of R&D programs was undertaken by NSTC and the evaluation results were considered as part of referendum for R&D budget appraisal by the Ministry of Planning and Budget (MPB).
- The National Science and Technology Foundation (Basic) Law was enacted in July, 2001 and the law requires the NSTC to prepare five year plan for S&T promotion and development.
- The first trial of preparing the plan started in 2001 and finished at the end of that year: 1st five year S&T plan covering the period of 2002 to 2006. Due to the newly elected Presidential cabinet, the plan was required to revise in terms of years to cover (from 2003 to 2007) and some major S&T policy and R&D development strategy.
- During the period of 2001 to 2003, NSTC has approved several R&D national strategies as follows:
 - (1) First version of National S&T promotion and development Plan(2002-2006) based on the National Strategic Priority for R&D Development
 - (2) Revised version of the Plan (2003-2007) based on the National Technology Road-Map (NTRM)
 - (3) The Next Generation Growth Engines Plan proposed and approved in the middle of 2003
 - (4) The highest position entitled by Information and S&T advisor to the President was newly introduced in February of 2002, and the Minister of S&T is supposed to be promoted as one of the Vice Prime Minister of Korean Ministerial Cabinet with a given authorization of overall monitoring and facilitating related policies.
 - (5) The full scale of national R&D program evaluation and pre-views and coordination of R&D budget is to be completely authorized to the S&T Innovation Headquarters affiliated, but independently operating, with the Ministry of S&T.
 - (6) The final results of '03 Technology Foresight' are expected to be introduced to the public in the end of 2004.

海外招聘スピーカー及び
国内スピーカー・セッションチェア他
プロフィール
(海外・国内順、アルファベット順)

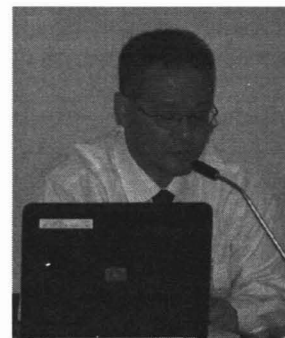
Name: Pyengmu D. Bark (朴秉武)

Current Position: Director General (團長)

Division of National Science and Technology
Planning and Evaluation

(科學技術企劃評價團)

Korea Institute of Science and Technology
Evaluation and Planning (KISTEP)



Address: 275 Yangjae-dong, Seocho-gu, Seoul 137-130, Korea

Phone 822-589-2291 Fax 822-589-2250 E-mail barkpm@kistep.re.kr

Personal Data:

Date of Birth : June 3, 1952

Nationality : Korean

Educational Background:

1988 Ph.D. in Applied Economics, Virginia Polytechnic Institute and State
University, Blacksburg, Virginia, USA

1984 MS in Economics and Mathematics(program completed), Illinois State University,
Normal, Illinois, USA

1980 BA in Economics, Sogang University, Seoul, Korea

Professional Experiences:

2002.12-present Director General, Division of National Science and Technology Planning
and Evaluation, KISTEP

2001.8-2002.12 Managing Director, Center for National S&T Planning, KISTEP

2000.3-2001.8 Director of National R&D Program Planning, KISTEP

1998.4-1999.4 Policy Advisor to the Minister of Science and Technology(MOST), Korea

1989.3-1996.7 Associate Professor, Department of Economics, The University of
Suwon, Suwon, Korea

Membership in Professional Societies:

Korea International Economics Association

Korea Economics Association

Korea Association of Technology Innovation

Korea Society of Technology Management and Economics

Key Qualifications:

- Has 5 year experience of performing national level planning projects such as National Science and Technology Basic Plan, 'Vision 2025', National Technology Road Map (NTRM), Priority Setting of R&D Strategy as well as national level evaluation projects such as national level evaluation of Government Supported Research Institutes(GSRI) and national R&D programs which run every year, as a project secretariat.
- Has 10 year experience of research mostly focusing on Science and Technology(S&T) and Research and Development (R&D) policies such as economic effects of S&T(R&D) investment, effects of R&D stimulating instruments such as financial support, government subsidies, tax credits, and government procurement in Korea.
- Has 5 year experience of research focusing on economic and technological analysis of construction industry, one of major service sectors in Korean economy, and innovation studies on construction firms as well as R&D policies in the industry.
- Has 7 year experience of teaching various economic courses such as micro-economics, statistics and mathematics for economists, econometrics, industrial economics, economics of innovation at graduate and undergraduate levels as a full-time lecturers.
- Has served as an expert and/or director, including expert of S&T advisory committee to the President of Korea (1991), with a wide variety of S&T (R&D) policy analysis and policy making process as well as industrial innovation studies in Korea.

Major Titles of Research Activities:

- Papers

The Role of Industrial Technology Policy in Economic Policy Perspective

Theory Review and Case Analysis on Impact of Technological Change on Employment

Technology and Knowledge Stock as a Production Input

Construction Technology and Economic Growth in Korea

Economic Perspective of Construction Technology Development and Primary Policy Direction

A Study on Technology Level and Technology Development in Korean Construction Industry

- Books

Impact of Government Regulation Policy on R&D Investment in Private Sectors

Optimum Level of R&D Investment and Expenditure and Its Allocations on National Level

Macroeconomic Forecasting Model and Technology Innovation

Competitiveness of Korean Construction Industry toward Global Economy

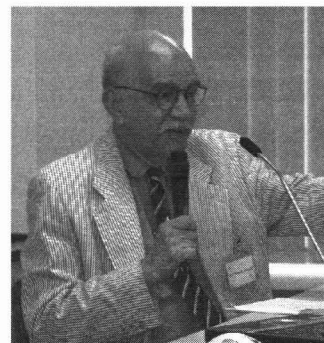
Optimal Level of R&D Investment in Korean Construction Industry

Development of R&D Indicators of Construction Industry and Direction of Its Growth

Performance Evaluation of Industrial Technology Support Program and Its New Direction toward Global Economy

William A. Blanpied

Biosketch



William A. Blanpied is Visiting Senior Research Scholar in the Science and Trade Policy Program at George Mason University. Prior to his retirement from the federal government in January 2003 he had been, since 1983, Senior International Analyst at the National Science Foundation (NSF), except for the period from July 1999 through August 2002 when he served as Director of the National Science Foundation's (NSF) Tokyo Regional Office in the US Embassy.

During his three-year tenure in Tokyo, Blanpied traveled extensively in Japan and East Asia in order to collect information for a number of reports on significant science policy events occurring in the region. He also maintained his involvement in organizing a series of US-China science policy seminars, the first of which was held in Beijing in October 1999. Prior to his departure for Tokyo in July 1999, Blanpied was responsible for evaluating U.S. and foreign science and technology policies and in analyzing opportunities for scientific cooperation in various regions, including East Asia, Central/Eastern Europe and the NAFTA region. He was US delegate and, for four years, Chair of the Organisation for Economic Co-operation and Development's (OECD) Group on the Science System, and has served as a consultant to the OECD Megascience Forum (now the Global Science Forum) since its creation in 1992. Blanpied also served as NSF's principal liaison officer for the International Council of Scientific Unions (ICSU).

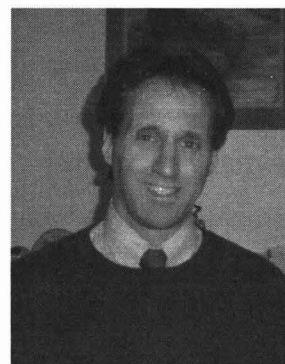
Blanpied's international experience prior to joining NSF included extended periods of working residence in Italy (as a post-doctoral fellow at the National Synchrotron Laboratory at Frascati) and India, where he served as resident physicist with the National Science Foundation's Science Education Liaison Staff in New Delhi from 1969-71. During his two years in India, he became interested in the development of modern science in Asia and has written and lectured extensively on that topic. Blanpied's current scholarly interest is in the development of science policy in the post-World War II period. He has presented invited lectures in several countries, including India, Hungary, Japan, Mexico and the People's Republic of China. During the early 1990s, he served concurrently as Chair of the American Physical Society's ad-hoc Task Force on the Crisis of Physics in the Former Soviet Union, and its Forum on International Physics.

Blanpied joined NSF in 1976 as Program Manager for Ethics and Human Values in Science and Technology. Subsequently, he served as Head of the Office of Special Projects in the Office of the Director before joining the Division of International Programs (since 2001 the Office of International Science and Engineering) in 1983. Prior to his service with NSF, he held faculty appointments in the physics departments at Case Western Reserve, Yale, and Harvard Universities, where his research interests were in experimental particle physics. While at Harvard, he established and served as first editor of an international newsletter that has since evolved into the quarterly journal, *Science, Technology and Human Values*. He left Harvard in 1974 to become Head of the Division of Public Sector Programs at the American Association for the Advancement of Science (AAAS), where he was among those responsible for instituting the annual AAAS budget analysis and the series of annual meetings which evolved into the AAAS Science and Technology Policy Colloquia.

Blanpied received his BS degree from Yale University in 1955 and his PhD in physics from Princeton University in 1959. He is a Fellow of the American Association for the Advancement of Science and the American Physical Society. From 1987 to 1989 he was on leave of absence from NSF as Scholar in Residence at the Graduate School of International Relations and Pacific Studies at the University of California, San Diego, and was an Adjunct Professor at George Mason University's International Institute from 1991 to 1996. He is the author or co-author of three books, and has published numerous articles and reviews in the professional literature on physics, history of science, international science, and science policy, including both its national and international aspects. In April 2003 Blanpied was designated as an International Affiliated Fellow of the National Institute for Science and Technology Policy in Tokyo. During the Fall 2003 semester he was a Visiting Professor in the School of Public Policy and Management at Tsinghua University, Beijing.

October 2003

Short Biography of Steven W. Collins



Steven W. Collins is Associate Professor of Global and Policy Studies at the University of Washington, Bothell. A political economist specializing in comparative science and technology history and policy, he studies the relationship between institutions and technological change. In 2003 he was a JSPS international research fellow at the Japan Advanced Institute of Science and Technology and visiting researcher at Ehime University's Regional Cooperative Research Center, where he has been conducting research on university-industry relations and management of technology. In 1991 and 1998 he was visiting researcher at NISTEP. He is author of the book "The Race to Commercialize Biotechnology," which has just been published by Routledge Press. Dr. Collins holds the B.S. in Chemical Engineering and Ph.D. in Political Science, both from the University of Virginia. Prior to entering academia, he was an engineer at Philip Morris USA (now Altria) and Eastman Kodak.

Luke Georghiou PhD, BSc

Professor of Science & Technology Policy and Management

Director of PREST

Associate Dean of Research, Faculty of Humanities

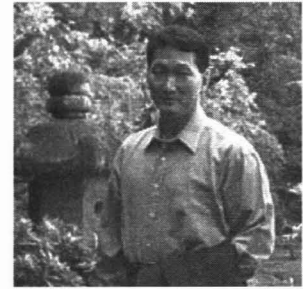


Luke is a Director of PREST and has been on its staff since 1977. His research interests include evaluation of R&D and innovation policy, foresight, national and international science policy, and management of science and technology. Recent projects include several studies of industry-science relations, policy for international scientific co-operation, evaluation of foresight, and changes in public sector research institutions. During 1999 he chaired the Strategic Review of the EUREKA Initiative and during 1996 he chaired the evaluation of the European Union's Framework Biotechnology Programmes. He has recently chaired committees on the effectiveness of Direct measures for R&D support on behalf of the European Commission, and the Evaluation of Futur - the German Foresight programme and TEP - the Hungarian Foresight Programme. Other committee memberships include the Finnish Public Research Funding Evaluation Committee, the Medical Research Council Steering Group for the Monitoring and Evaluation of Research Funding Schemes, and the Steering Committee of the EIRMA UK Forum. He is a consultant to several Ministries in the UK, to the OECD, the European Commission, several foreign governments and major companies. His current teaching activities include an **MSc** unit and associated short course on **Evaluation of Science and Technology Policies**; the British Council High Level Seminar on S&T Policy and Management; and **PhD** supervision.

Selected major publications include:

- *Post-Innovation Performance - Technological Development and Competition* (MacMillan 1986)
- *Evaluation of Research* (OECD, Paris 1986)
- *Evaluation of the Alvey Programme* (HMSO, London 1991)
- "The UK Technology Foresight Programme" *Futures* Vol.28 No.4, pp359-377, 1996
- "Equipping Researchers for the Future" *Nature* Vol.383 pp663-664, October 1996
- Georghiou L and Roessner JD, "Evaluating Technology Programs: Tools and Methods", *Research Policy* Vol.29 Nos.4-5 April 2000 657-677,
- Georghiou L, "Socio-economic effects of collaborative R&D - European Experiences", April 1999, *Journal of Technology Transfer* Vol 24
- Coombs R and Georghiou L "A new "Industrial Ecology" " *Science* Vol 296 19 April 2002 471

Gerald J. Hane
Founder & President
Globalvation



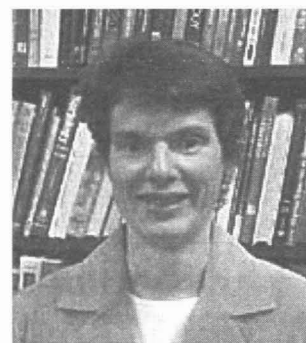
Dr. Hane is Founder and President with the global innovation research and strategy practice, *Globalvation*. His work is directed at identifying and assessing opportunities for partnership and investment involving advanced technology firms, with a particular focus on cross-border linkages with Japan and the Asia Pacific. Dr. Hane also consults to governments regarding science and technology policy challenges. Current work includes facilitating venture technology and investment partnerships between the U.S. and Japan, evaluating cross-border (U.S.-Japan) venture capital opportunities and management, assessing emerging regional advanced technology firms, and examining technology transfer opportunities and policies in the U.S. and Japan. He serves as an Advisor to the Global Venture Industries Network, an initiative of a Japanese Association (*Shin Keiei Kenkyukai*) comprising executives from 500 major corporations, to more effectively link global ventures with Corporate partners in Japan.

Prior to this work, Dr. Hane was Principal Assistant Director for International Strategy and Affairs at the *White House Office of Science and Technology Policy* (OSTP). Dr. Hane launched the White House effort to advance the National Nanotechnology Initiative, and he co-chaired with the Director of the Centers for Disease Control the government initiative to fight global infectious diseases. He worked very closely with key U.S. research institutes including the National Institutes of Health, National Science Foundation, Department of Energy, National Institute for Standards and Technology, Defense Advanced Research Projects Agency, NASA, as well as others, on issues such as research prioritization, technology transfer, and technology commercialization. Before coming to OSTP in January 1995, Dr. Hane was a Professional Staff Member of the *Committee on Science, Space, and Technology of the U.S. House of Representatives*. There his responsibilities included advanced manufacturing technologies, medical technologies, environmental technologies, defense dual-use technologies, and aviation and aerospace technologies. He has been a Visiting Researcher at the *National Institute of Science and Technology Policy* (NISTEP) of Japan's Science and Technology Agency, and has worked for the *Pacific Northwest Laboratory of the Battelle Memorial Institute* as a Research Engineer, specializing in international technology assessments and research and development planning. Dr. Hane received his Ph.D. in Political Economy and Government from *Harvard University* in 1992. His dissertation, supported by a Fulbright-Hays Grant for Dissertation Research Abroad, examined the role of collaborative research and development activities in innovation in Japan. He has B.S. and M.S. degrees in Mechanical Engineering from *Stanford University* (1980).

Diana Hicks

Professor and Chair of the School of Public Policy

D.Phil, SPRU, University of Sussex, Science and Technology Policy
M.Sc., SPRU, University of Sussex, in Science, Technology and
Industrialization
B.A, Grinnell College, physics



Diana Hicks is Professor and Chair of the School of Public Policy, Georgia Tech. Hicks specializes in science and technology policy as well as in innovative use of large databases of patents and papers to address questions of broad interest at the intersection of science and technology. Her recent work has focused on assessing the technological impacts of scientific research and on using visualization to more effectively convey complex research results to the policy making community. She is also examining highly innovative small firms and exploring their survival and technological contributions.

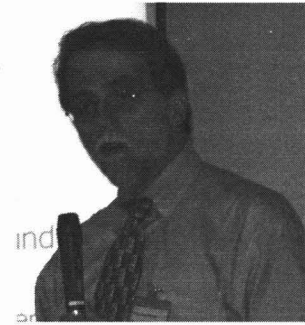
She has published extensively on issues at the interface between science and technology, examining quantitative evidence of the evolving character of the research system and its relationship to innovation in the US; establishing that high quality scientific research has a high impact on technology; examining why companies undertake basic research; and being the first to argue that the accepted view of Japanese university-industry links as weak is not entirely accurate. She has also published critiques and reflections on the methodology of bibliometric analysis. Her work has appeared in such journals as: *Policy Sciences*, *Social Studies of Science*, *Nature*, *Research Policy*, *Science and Public Policy*, *Research Evaluation*, *Research Technology Management*, *R&D Management*, *Scientometrics*, *Revue Economique Industrielle*, *Science Technology and Human Values*, *Industrial and Corporate Change*, *Japan Journal for Science, Technology and Society*.

For almost 10 years Hicks was on the faculty of SPRU, University of Sussex in the U.K. At SPRU she taught graduate level courses in science and technology policy, science studies as it relates to policy, and research methods. She also administered the masters degree.

Her work has been supported by and has informed policy makers on three continents. She was previously the Senior Policy Analyst at CHI Research, Inc. She has conducted quantitative assessments and served as a consultant for the Advanced Technology Program of the National Institute of Standards and Technology, the American Cancer Society, the Council for Chemical Research, the Department of Energy, the heads of the UK Research Councils, the Japanese National Institute for Science and Technology Policy, the National Science Foundation, the Small Business Administration, and The Royal Society in the UK. Prof. Hicks has taught at the Haas School of Business at the University of California, Berkeley and worked at the National Institute of Science and Technology Policy (NISTEP) in Tokyo. She is an honorary fellow of the Science Policy Research Unit, University of Sussex, UK and on the Academic Advisory Board for Center for Science, Policy and Outcomes, Washington D.C.

Christopher T. Hill

Christopher T. Hill is Vice Provost for Research and Professor of Public Policy and Technology at George Mason University in Fairfax, Virginia. After earning three degrees in chemical engineering and practicing in that field at Uniroyal Corporation and Washington University in St. Louis, he has devoted the past twenty-five years to practice, research and teaching in science and technology policy, including service at MIT, the Office of Technology Assessment, the Congressional Research Service, the National Academy of Engineering and the RAND Critical Technologies Institute.



PROFESSIONAL EXPERIENCE -- SUMMARY

- 2001 – present Technology Policy International (Boston, Washington, Silicon Valley, Tokyo)
 - 2001 – present Principal
- 2001 – present George Mason Intellectual Properties, Inc., Fairfax, VA
 - 2001 – present President
- 1994 – present George Mason University, Fairfax, VA
 - 1997 – present Vice Provost for Research
 - 1994 – present Prof. of Public Policy and Technology, School of Public Policy
 - 1995 – 1997 Director, Doctoral Program in Public Policy
- 1993 – 1994 Critical Technologies Institute, RAND, Washington, DC
 - Senior Policy Analyst
- 1990 – 1993 National Academy of Engineering and National Academy of Sciences, Washington, DC
 - 1990 – 1993 Executive Director, The Manufacturing Forum
 - 1992 – 1993 Staff Director, Manufacturing Subcouncil, Competitiveness Policy Council (under contract between NAS and CPC)
- 1983 – 1990 Congressional Research Service, The Library of Congress, Washington, DC
 - Senior Specialist in Science and Technology Policy (GS-17)
- 1978 – 1983 Center for Policy Alternatives, MIT, Cambridge, MA
 - 1978 – 1983 Senior Research Associate
 - 1980 – 1981 Assistant Director for Budget and Finance
- 1977 – 1978 Office of Technology Assessment, Washington, DC
 - Senior Professional Staff Member and Project Leader, Materials Program
- 1970 – 1978 School of Engineering and Applied Sciences, Washington University, St. Louis, MO
 - 1976 – 1978 Associate Professor of Technology and Human Affairs
 - 1974 – 1978 Associate Professor of Chemical Engineering
 - 1970 – 1974 Assistant Professor of Chemical Engineering.
 - 1972 – 1978 Associate Director, Center for Development Technology
- 1968 – 1970 Uniroyal Corporation, Central Research Laboratory, Wayne, NJ
 - Research Engineer, Polymer Physics Section
 - Group Leader, plastics rheology group
- 1964 Summer Humble Oil and Refining Company (now EXXON), Baytown, Texas
 - Summer Engineer, Technical Services, Baytown refinery.
- 1960 – 1963 Hope Natural Gas Company (now Consolidated Natural Gas Co.), Clarksburg, WV
 - Summer employee in engineering, gas dispatching, and field operations
- 1958 – 1968 Part-time professional musician (saxophone) and jazz band leader, Clarksburg, WV; Chicago, IL; and Madison, WI.

Professor Dr. Stefan Kuhlmann

Deputy Director, Fraunhofer Institute for Systems & Innovation Research



Studied political science and history at the University of Marburg; degree 1978; doctorate 1986 (Dr. rer. pol) and habilitation 1998 (political science) at the University of Kassel. 1979 - 1988 research fellow at the Kassel University in the field of informatisation of the public administration and the service sector.

Joined the Fraunhofer ISI in 1988; since 2004 deputy director of the institute.

Since summer 2001 also Professor for Innovation Policy Analysis at Department for Innovation Studies (DIS) of the University Utrecht, The Netherlands.

DIS and ISI co-operate in research and teaching.

Present research interests:

- Public policy analysis, with a focus on the research and innovation system in Europe
- Planning, prioritization and evaluation of research, technology and innovation policies (national, international, regional)
- Technology assessments

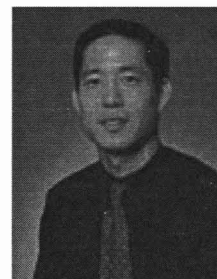
Academic teaching:

- Professor for Innovation Policy Analysis, University Utrecht
- R&D Programme Evaluation Course. Methods, Experiences and New Approaches, Centre for Advanced Studies, University of Twente/Enschede
- PhD Training: Netherlands, Graduate School of Science, Technology and Modern Culture (WTMC)

Membership of scientific and professional associations:

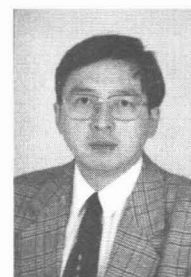
- Member of the Executive Committee European Network of Excellence PRIME (Policies for Research and Innovation on the Move towards the European Research Area).
- "Six Countries Programme" - The International Innovation Network (Steering Committee)
- "European RTD Evaluation Network" of the European Commission, Directorate General Research
- Editorial Advisory Board of the Journal "Evaluation"
- Associate Editor "International Journal of Foresight and Innovation Policy (IJFIP)"

Kei Koizumi



Kei Koizumi is Program Director of the R&D Budget and Policy Program at the American Association for the Advancement of Science (AAAS). He is known as a leading authority on the federal budget, federal support for research and development, science policy issues, and R&D funding data. He is the principal budget analyst, editor, and writer for the annual AAAS reports on federal R&D and for the continually updated analyses of federal R&D on the AAAS R&D web site. He is widely quoted in the general and trade press on federal science funding issues and speaks on R&D funding trends and federal budget policy toward R&D to numerous public groups and seminars. Kei Koizumi received his M.A. from the Center for International Science, Technology, and Public Policy program at the George Washington University and received his B.A. from Boston University in Political Science and Economics.

Rongping Mu's CV



Dr. Rongping Mu was born in Hefei, P.R. China on 12 Oct. 1960, and received his B.S. in Physics and M.Sc. in History of Science in the University of Science and Technology of China, and got his Ph.D from Technische Universität Berlin of Germany. Mu has been an assistant in Hefei Poly-technical University for four years. Since 1990 he has been working in the Institute of Policy and Management (IPM), Chinese Academy of Sciences (CAS).

Since 1993 Mu has visited many research institutions in Bucharest (Romania), in Bonn, Munich and Berlin (Germany) and Vienna (Austria), in Paris (France) and London (UK), in Gothenburg (Sweden), in Moscow (Russia) and Kiev (Ukraine), in Tokyo (Japan), and in Atlanta, Oregon, New York and Washington DC (USA). He currently works in the fields of Technology Management, Innovation Policy and History of Technology.

Dr. Mu was awarded the Third-grade Prizes of Awards for S&T Progress from Chinese Academy of Sciences in 1999 for his research work "Strategic Studies for Planning of Beijing Zhongguancun S&T Park", and the Third-grade Prizes of Awards for S&T Progress from Beijing Municipal Government in 2000 for his research work "Research on Transformation of National Engineering Research Center".

Dr. Mu is now Professor and Executive Vice Director-General of IPM, Chinese Academy of Sciences. Besides, he is the Deputy Secretary General of the China High-tech Industry Promotion Society (CHIPS), and the Chairman of the Sub-commission for Science and Technology Policy of Chinese Association for Science of Science and S&T Policy Research.

As project Manager, he has completed lots of research projects consigned by Governments and National Natural Science Foundation of China (NNSFC), some on-going and finished are as following:

Project	Financial Support
Transformation of National Engineering Research Center	State Planning Commission
High-tech Development Report in China	CAS
Planning Research for Long-term Development of Beijing Zhongguancun S&T Park	BMCST ^(note)
Study on the Development Strategy for Beijing Zhongguancun S&T Park	BMCST
Knowledge-based Economy and Development Strategy for China High-tech Industry	State Planning Commission
Planning Research for National Science Think-tank of the CAS	CAS
Methodology for Evaluating International Competitiveness of High-tech Industry	NNSFC
Methodology for Technology Foresight and Policy Selection	MOST
International Technology Transfer: Theoretical, Methodological and Case Studies	BMCST
Mechanism of Funding Distribution of National Natural Science Foundation of China	NNSFC
Technology Foresight in 2020	CAS

^(note) Beijing Municipal Commission of S&T, BMCST.

Annex: Publications (selected):

- (1) "Study on Methodology for Large R&D Program Management", *Science Research Management*, Vol. 18, No.4 July 1997.
- (2) "Technology Transfer from Germany to China _Case Study on Shanghai Volkswagen", *Science Research Management*, Vol. 18, No.6, 1997.
- (3) "Study on Factors Affecting International Technology Transfer", *Studies in Science of Science*, Vol.15, No. 4, 1997.
- (4) "China System Reform and Transformation of National Engineering Research Center", Proceedings of International Symposium on Science and Technology Policy, Beijing 5-7 Oct. 1997.
- (5) "Study on Issues relate to the Transformation of National Engineering Research Center", *Science of Science and Science & Technology Management*, No.11, 1997.
- (6) "Study on Cooperation between Industries, Universities and Research Institutes", *Research on Science and Technology Management*, No. 2, 1998.
- (7) "Study on Professional Qualification Institution for Agent of State-owned Property", *Science Research Management*, Vol. 19, No.6, 1998.
- (8) "Study on Organization Behavior of National Engineering Research Center in Transformation", *Science Research Management*, Vol. 20, No.1, 1999.
- (9) "Study on Management System of Transformed National Engineering Research Center" (I/II), *Science of Science and Science & Technology Management*, No.9 and No.10, 1999.
- (10) "Study on the Methodology for Evaluating the International Competitiveness of Hi-tech Industry", *Proceedings of 1st Sino-US Science Policy Seminar*, Beijing China, 24-27 October 1999.
- (11) "Elementary Study on the Methodology for Evaluating the International Competitiveness of Hi-tech Industry", *Science Research Management*, Vol. 21, No.1, 2000.
- (12) "Evaluation of the International Competitiveness of China Communication Industry", *Studies in Science of Science*, Vol.18, No. 3, 2000.
- (13) "Study on the Methodology for Evaluating the International Competitiveness of Hi-tech Industry", *China Forum of Science and Technology* No.3, 2000.
- (14) "Evaluation of the International Competitiveness of Chinese Hi-tech Industry", in: Chinese Academy of Sciences: *Hi-tech Development Report 2000*, Science Press.
- (15) "Evaluation of the International Competitiveness of Chinese Medicine Industry", *Science Research Management*, Vol. 22, No.2, 2001.
- (16) "Technology Foresight and Policy Selection in China", *Paper presented in the ISF'2001—The 21 International Symposium on Forecasting*, Atlanta USA, June 17-21, 2001.
- (17) "Planning Research for Long-term Development of Beijing Zhongguancun S&T Park", in: Lin Wenyi, Fan Boyuan: *The Sun Is Rising: Long-term Development Planning of Beijing Zhongguancun S&T Park*, Beijing: Beijing Science and Technology Press 2000.
- (18) "Evaluation of the International Competitiveness of Chinese Space & Aviation Industry", in: Chinese Academy of Sciences: *Hi-tech Development Report 2003*, Science Press.
- (19) Evaluating the international competitiveness of Chinese Aerospace & Aviation Industry, in: *Science Research Management*, Vol. 24, No.6, 2003
- (20) Study on the Key Factors determining the Scale of Technology Market, in: *Science of Science and Science & Technology Management*, Vol.24, No.4, 2003.

Books:

- (1) **Mu Rongping and W. A. Blanpied** (editors in Chief): Proceedings of 1st Sino-US Science Policy Seminar, Beijing China, 24-27 October 1999, Science Press 2000 (In Chinese and English)
- (2) **Mu Rongping**: *Technology Transfer from Germany to China: Case Studies on Chinese Carmakers and Parts Suppliers*, Technische Universität Berlin 2001

Institute of Policy and Management (IPM), Chinese Academy of Sciences (CAS)
P. O. Box 8712, Beijing 100080, P.R. China
Fax: 0086-10-62542619, Tel.: 0086-10-62542618 (office)
E-mail: mrp@mail.casipm.ac.cn.

I. PERSONAL INFORMATION

Surname: Muldur
First name: Ugur
Nationality: French
Date of birth: 6 April 1957
Marital status: married, 2 children



II. EDUCATION

1990 Ph.D. in Economics Sciences, University of Paris XIII
1981 D.E.A. (advanced university studies) in industrial and international strategies, University of Paris XIII
1980 Masters in Applied Economy, option "Statistics and Economy", University of Paris IX, Dauphine and ENSEA
1979 Licentiate in Applied Economy, University of Paris IX, Dauphine
1978 Licentiate in Management, University of Paris IX, Dauphine

III. PROFESSIONAL EXPERIENCE

2004- Head of Unit «Impact analysis of community actions for the Framework programme» in Directorate «Coordination of community activities» within DG Research, responsible for the preparation of impact assessment and ex-ante evaluation for the 7th Framework Programme.
1997-03 Head of Unit «Competitiveness, economic analyses, indicators» in Directorate «Knowledge-based society and economy», contribution to the preparation of the Lisbon Strategy and the European Research Area, responsible for benchmarking of research policies and mapping of excellence.
1993-97 Responsible of "S&T Indicators task force" within Directorate «Strategy and coordination» in DG Research, contributing to the preparation of the 5th Framework Programme and the Green Book on Innovation.
1990-93 Administrator (laureate in EEC open competition A/629) in unit «Forecasting and assessment of S&T» (FAST), preparation of chapter four of the White Paper «Growth, Competitiveness and Employment» of Mr J. Delors, responsible for conceiving and preparing the first European Report on S&T indicators (REIST).
1985-90 Director within the Banking Department of the Caisse des Dépôts des Consignations, responsible for the internationalisation of banking activities of the Group
1985-87 National Expert seconded to the EC, responsible for the preparation of the Recommendation on harmonisation of electronic banking cards.
1980-84 Lecturer at the University of Paris XIII and researcher at the Centre de recherche en économie internationale (CREI).

IV. PUBLICATIONS

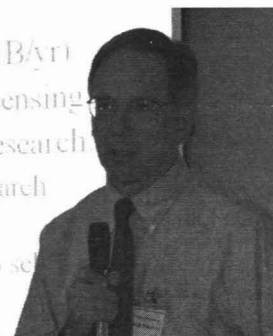
Several publications (books, reports, articles) on banking economy, economic analysis for technological progress, S&T policies and innovation

V. OTHER FIELDS OF INTEREST

History, philosophy and bridge

Patrick H. Windham

Mr. Windham is a California-based consultant on science and technology policy issues. He is a principal in Technology Policy International, a five-person firm that analyzes technology policies and policy trends for international clients. He also operates his own firm, Windham Consulting, which focuses on how federal, state, and regional technology policies can promote national and regional economic growth. Windham Consulting's clients have included the American Association for the Advancement of Science, the California Council on Science and Technology, the National Academy of Engineering, the Optoelectronics Industry Development Association, the Procter & Gamble Company, and the University of California, San Diego.



Mr. Windham also is a Lecturer in the Public Policy Program at Stanford University.

Previous Positions

From 1984 until 1997, Mr. Windham served as a Senior Professional Staff Member for the Subcommittee on Science, Technology, and Space of the Committee on Commerce, Science, and Transportation, United States Senate. His work there focused primarily on policies to strengthen U.S. industrial competitiveness. He assisted Senator Ernest Hollings (D-SC) in the creation of several initiatives, including the Commerce Department's Manufacturing Extension Partnership and Advanced Technology Program. He worked in other U.S. Senate positions from 1976 to 1978 and from 1982 to 1984.

Education

Mr. Windham received an A.B. from Stanford University and a Master of Public Policy from the University of California at Berkeley.

Curriculum Vitae of Koichi Abe

[as of August 2004]



Date of Birth: November 10, 1969

Place of Birth: Kanagawa Pref., Japan

Present Position: Senior Research Fellow, 1st Policy-Oriented Research Group, National Institute of Science and Technology Policy (NISTEP), Ministry of Education, Culture, Sports, Science & Technology (MEXT)

Education: Graduate School of Law, Chuo University

Employment (main career):

- 1992 International Affairs Division, Science and Technology Promotion Bureau, Science and Technology Agency (STA)
- 1994 Chief of Section, Research Division, Science and Technology Policy Bureau, STA
- 1996 Chief of Section, Space Utilization Division, Research and Development Bureau, STA
- 1997 Deputy Director, Office for the Litigation of Nuclear Safe Regulation, Nuclear Safety Bureau, STA
- 2001 Deputy Director, Litigation Office, Nuclear and Industrial Safety Agency, Ministry of Economy, Trade and Industry (METI)
- 2001 Deputy Director, Space Development and Utilization Division, Research and Development Bureau, MEXT
- 2002 Deputy Director, Office for Regional Relations for R&D Facilities, Research and Development Bureau, MEXT
- 2004 Senior Research Fellow, 1st Policy-Oriented Research Group, NISTEP

Short Biography of Akira Goto



Akira Goto is a Professor of Economic Engineering at the Research Center for Advanced Science and Technology of the University of Tokyo. He holds a Ph.D. in Economics from Hitotsubashi University. His main research areas are the economics of innovation and competition policy.

Previously, Professor Goto was a Director at the Research Center for Advanced Economic Engineering of the University of Tokyo, a Professor of Economics at Hitotsubashi University, and a Director in Research at the National Institute of Science and Technology Policy in the Science and Technology Agency.

Professor Goto has served on various national and international government committees dealing with technology policy and competition policy. Among other positions, he is currently the chairman of the Patent System Subcommittee of the Industrial Structure Council of the Ministry of Economy, Trade and Industry, and a Faculty Fellow of the Research Institute of Economy, Trade and Industry.

Professor Goto has published in such journals as the *Review of Economics and Statistics*, the *European Economic Review*, the *Journal of Industrial Economics*, the *Journal of Economic Literature*, and *Research Policy*. He has also published several books, including *Innovation and Industrial Organization in Japan* (Tokyo University Press), and, with Hiroyuki Odagiri, *Technology and Industrial Development in Japan* (Oxford University Press), as well as editing several books on innovation and competition policy.

August 2004

Dr. Yuko Harayama received her Ph.D in Education Science in 1996 and a Ph.D in Economics in 1997, both from the University of Geneva, Geneva, Switzerland.



Dr. Harayama has a broad range of experience that encompasses work as a visiting scholar at the Center for Economic Policy Research at Stanford University, an Assistant Professor in the Department of Political Economy at the University of Geneva, a Lecturer in the Department of Political Economy at the University of Neuchatel in Switzerland, a Fellow at the Research Institute of Economy, Trade and Industry in Japan. She currently serves as a Professor in the Management Department of Science and Technology at the Graduate School of Engineering of Tohoku University, Japan, a Fellow at the National Institute of Science and Technology Policy, a Member of the Committee for Intellectual Property Strategy and member of the Committee for Evaluation at the Council for Science and Technology Policy in Japan.

Dr. Harayama has published numerous articles and papers related to her particular areas of expertise that include science and technology policy, technology transfer and higher education. Her recent publications are as follows:

Dynamique de la creation de connaissances: Microsystemes en Suisse romande,

Y. Harayama, A. Mack, M. Zarin-Nejadan, Bern, Peter Lang, 2004

"The Japanese R&D system in the field of fuel cell vehicles," in Avadikyan et al.

The Economic Dynamics of Fuel Cell Technologies, Springer. Avadikyan & Harayama, 2003

Industry-academia Cooperation -Toward Institutional Design to Cultivate Innovative Power-, Toyo Keizai, 2003,

"The Development of Silicon Valley and the Curriculum change at Stanford University", in Aoki, M. & al., *University Reform: Issues and Controversies*, Toyo Keizai, 2001

Le Systeme Universitaire JAPONAIS, Paris, ECONOMICA, 2000

Takayuki Hayashi, Ph.D.



Present position

Research fellow, Faculty of University Evaluation and Research, National Institution for Academic Degrees and University Evaluation

Guest researcher, National Institute for Science and Technology Policy

Research Areas

Science and technology policy studies, Scientometrics, University evaluation

1996.3

Bachelor of Liberal Arts, College of Arts and Sciences, University of Tokyo (history of science)

1998.3

M.S., Graduate School of Arts and Sciences, the University of Tokyo (science and technology policy)

2001.3

Ph.D., Graduate School of Arts and Sciences, the University of Tokyo (science and technology policy)

2001.4-present

Research fellow, Faculty of University Evaluation and Research, National Institution for Academic Degrees and University Evaluation

Hiroto Ishida



Born; Sept.16,1941

Present position

President, Kanazawa Gakuin University

Principal Fellow (Chair), CRDS (Center of Research and Development Strategy), JST (Japan Science and Technology Agency)

Specially Appointed Professor, University of Tokyo

Research Areas: Science Policy, Nuclear Energy Policy

- | | |
|-----------|--|
| 1964 | Graduated from the University of Tokyo (Nuclear engineering) |
| 1964 | Joined the Science and Technology Agency (STA) |
| 1968-70 | University of Illinois (MA, Political Science) |
| 1982-85 | Science Counselor, Embassy of Japan in U.S. |
| 1991-94 | Director General, Atomic Energy Bureau, STA |
| 1994-95 | Deputy Vice Minister, STA |
| 1995-98 | Vice Minister, STA |
| 1999-2003 | Ambassador of Japan to Czech Republic |

September 7, 2004

Curriculum Vitae of Naoya Kaneko

Mr. Naoya Kaneko

Present Position:

General Manager

Center for the Strategy of Emergence

The Japan Research Institute, Limited



Research Areas:

“Science & Technology Policy” and “Technology and Business Incubation”

1978: graduated from University of Tokyo (industrial chemistry)

1978-1990: Hitachi Chemical Company Limited

1978-1979: engaged in R&D of ceramic packages for electronic switch-board

1979-1981: engaged in R&D of ceramic power processing

1981-1983: engaged in R&D of ceramic multilayer substrates for large computer

1983-1986: engaged in R&D of ceramic multilayer condensers

1987-1990: engaged in R&D of fluoride glasses for glass-fiber

1986-1987: Visiting Scientist, Massachusetts Institute of Technology

1986-1987: engaged in basic research of ceramic powder processing science

1990- : The Japan Research Institute, Limited

1990-1995: engaged in business incubation of In-Situ Vitrification (ISV) Technology

1991-1992: engaged in business incubation of Bioremediation Technology

1991-1994: engaged in R&D project by METI, for applying “ISV” to environmental preservation

1994-1997: engaged in R&D project by METI, for applying “ISV” to civil engineering

1994-1997: engaged in R&D project by NEDO, for applying “ISV” to waste management

1997-1999: engaged in Environmental Technology Evaluation Project by Kagawa Prefecture, for solving “Teshima Waste Management Problem”

1999- : engaged in various researches related to “Intellectual Properties (IP)”

2001- : engaged in various researched related to “Human Resources in Science & Technology”

2001- : engaged in various researches related to “Regional Innovation”

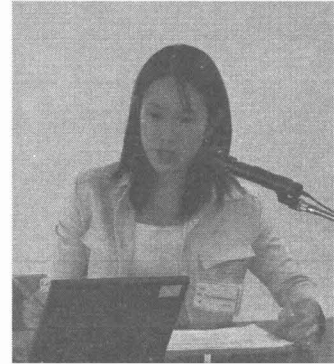
2003- : engaged in technology incubation, targeting “IPs developed by regional research institutions”

NAME: Noriko Kawamura

NATIONALITY: Japanese

EDUCATION: Diploma International Relations, London School of Economics
and Political Sciences
B.A. Regional Studies (East Asian Studies), University of Leeds

**YEARS OF
EXPERIENCE:** 10 years



SUMMARY OF WORK EXPERIENCE

From October 2002 to date

Employer: Mitsubishi Research Institute, Inc.

Position: Staff Researcher, Industrial Policy Department

From October 2000 to September 2002

Employer: Mitsubishi Research Institute, Inc.

Position: Staff Researcher, Global Industry Research Department

From April 1999 to September 2000

Employer: Mitsubishi Research Institute, Inc.

Position: Staff Researcher, Asian Market Research Department

From October 1995 to March 1999

Employer: Mitsubishi Research Institute, Inc.

Position: Assistant, Asian Market Research Department

From April 1994 to September 1995

Employer: Mitsubishi Research Institute, Inc.

Position: Secretary, Administration and Personnel Division

Masayuki Kondo



Dr. Masayuki Kondo from Japan holds a BS and an MS in Control Engineering and a Ph.D. in Management Engineering from the Tokyo Institute of Technology, an MS in Electrical Engineering from the University of Washington and an MS in Engineering-Economic Systems from Stanford University. He was born in Tokyo on June 1, 1950.

At present Dr. Kondo is Professor at the Graduate School of Environment and Information Sciences, Yokohama National University, where he researches innovation policies including university spin-off policy, R&D investment and R&D evaluation, and technology strategy in developing countries. He is also Director of Research at the National Institute of Science and Technology Policy (NISTEP), the Ministry of Education, Culture, Sports, Science and Technology (MEXT). During his academic career, Dr. Kondo also taught as Professor at the Kochi University of Technology and as Associate Professor at Graduate School of Policy Science, Saitama University, and was Visiting Fellow at Royal Institute of International Affairs (Chatham House) in UK and was Visiting Scholar at Fraunhofer Institute for Systems and Innovation Research (FhG-ISI) in Germany.

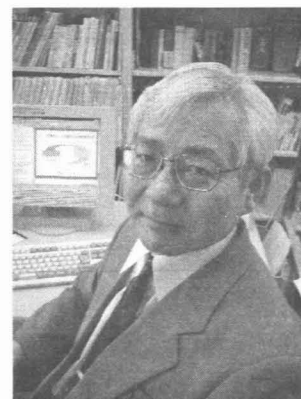
Previously Dr. Kondo held several positions in the Ministry of International Trade and Industry (MITI) including Director of the Technology Evaluation Division, Director of the Research and Planning Office and Director of Machinery and Aerospace R&D.

At the World Bank, Dr. Kondo assumed a position as Industrial Economist in order to perform technology studies, technology policy reviews and strategy making in numerous developing countries.

Dr. phil. Fujio Niwa

Present Position:

Professor, National Graduate Institute for Policy Studies,
Affiliated Senior Fellow, National Institute of Science and
Technology Policy



Research Areas: Science and Technology Policy, and Research and Technology Analysis

1966: graduated from the University of Tokyo (mechanical engineering)

1968: received Master of Engineering from the University of Tokyo (mechanical engineering)

1970 - '75: Researcher at Studiengruppe für Systemforschung, Heidelberg in Bundesrepublik
Deutschland

1973 - '75: Graduate Student at Universität Heidelberg (psychology)

1973 - '74: Lecturer at Gesamt Hochschule Kassel

1975: received Doktor der philosophiae (Dr. phil.) from Universität Heidelberg

1975 - '92: Associate Professor at the University of Tsukuba, Institute of Socio-Economic
Planning

1977 - '81: Chief Researcher at National Institute for Environment Studies

1988 - '90: Director of Research at National Institute of Science and Technology Policy
(NISTEP)

1990 - '92: Associate Professor at the University of Tsukuba, Institute of Socio-Economic
Planning

1990 - Present: Affiliated Senior Fellow at NISTEP

1992 - '97: Professor at the Graduate School of Policy Science, Saitama University

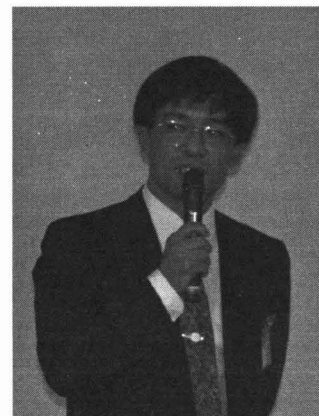
1995 - '97: OECD Examiner for the Korean Science and Technology Policy

1997 - Present: Professor at the National Graduate Institute for Policy Studies (GRIPS)

August 21, 2004

Curriculum Vitae of Naoki Saito

[as of July 2004]



Date of Birth: December 4, 1962 (Married, with 3 sons)

Place of Birth: Kanagawa Pref., Japan

Present Position: Director, 3rd Policy-Oriented Research Group,
National Institute of Science and Technology
Policy (NISTEP), Ministry of Education,
Culture, Sports, Science & Technology (MEXT)

Education: Master of Philosophy, Graduate School of Arts & Science, University of Tokyo
(Major: Research on the architecture of Japanese language from the viewpoint of information theory)

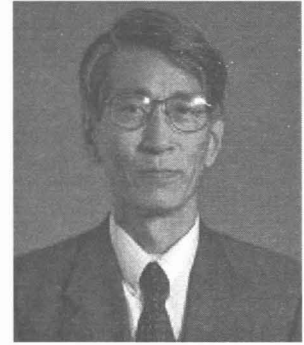
Employment:

- 1987 Policy Division, Science and Technology Policy Bureau, Science and Technology Agency (STA)
- 1988 Planning Division, National Institute of Science and Technology Policy (NISTEP), STA
- 1989 Chief of Section, Nuclear Fuel Division, Atomic Energy Bureau, STA
- 1992 Senior Staff, Office of Public Relations, Minister's Secretariat, STA
- 1992 Secretary to the Parliamentary Vice-Minister for Science & Technology
- 1994 Deputy Counselor (for Technological Issues), Mutsu-Ogawara Development Bureau, Aomori Prefectural Government Office
- 1996 Deputy Director, International Affairs Division, Science and Technology Promotion Bureau, STA
- 1997 First Secretary, Embassy of Japan in Australia
(Areas of responsibility: S&T, Environment, Health and Medical issues)
- 2000 Deputy Director, Policy Division, Science and Technology Policy Bureau, STA
- 2001 Director, Planning Division, NISTEP
- 2003 Director, 3rd Policy-Oriented Research Group, NISTEP

Major Publications:

- 'A Study on Conditions and Promotion Policy for Successful Regional Innovation: Developing Japanese-Type Sustainable Regional Clusters', Policy Study No.9, NISTEP, March 2004
- 'Study for Evaluating the Achievements of the S&T Basic Plans in Japan: Achievements and Issues of Major Policies for Industry-Academia-Government Cooperation and Regional Innovation', NISTEP REPORT No.78, May 2004
- 'Study for Evaluating the Achievements of the S&T Basic Plans in Japan: Comparative Analysis of S&T Policies and their Achievements in Major Countries', NISTEP REPORT No.81, May 2004

CV of Prof. H. SAKAKI:



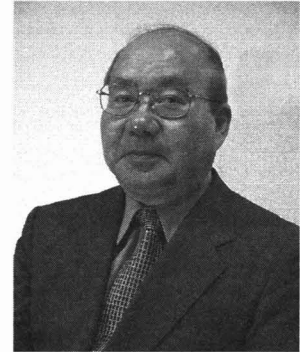
Prof. Sakaki received BS in 1968, and MS and Ph.D degrees in electronic engineering in '70 and '73 all from University of Tokyo (UT). In '73, he became associate professor of UT and has been full professor since '87. In '76-'77, he was a visiting scientist in Dr Leo Esaki's group of IBM Watson Research Center and in '99 visiting professor in Ecole Normale Supérieure.

In '68-73, he worked on electrons in MOS-FET channels and clarified the role of quantization at 300K. Since '74, he has done pioneering studies on semiconductor nanostructures; they include seminal works to control electrons with quantum dots (QD) and quantum wires (QWR) for new types of transistors ('75-'76, '80) and lasers ('82), the first in-plane transport studies of electrons in type-I and II quantum wells (QWs) and superlattices (SLs) ('76-'77), the invention of intersubband QW infrared photodetectors ('77), and the MBE synthesis of QWs, QWRs, and QDs and related studies to disclose physics and rich device potentials of confined electrons in these systems ('76-'02).

He received Medal of Honor (Purple Ribbon), Heinrich Welker Award, IEEE D. Sarnoff Award, Fujiwara Prize, Hattori-Hoko Award, IBM Japan Science Award, Shimadzu Science Award and so on. He is a fellow member of IEEE, APS, and IEICE.

Dr. Masaharu Sakuta

Research Director, The Japan Research Institute, Limited



Studied Construction Engineering at the University of Tokyo; BSC degree in 1969 and MS degree in 1971.

Joined Takenaka Corporation (general contractor) in 1971.

Studied Civil Engineering at Post Graduate School, King's College, London; PhD degree in 1981.

Joined The Japan Research Institute, Limited in 1990.

Present Research Areas:

- Technology Management of private firms
- New Business Strategy of private firms
- Technology Policy

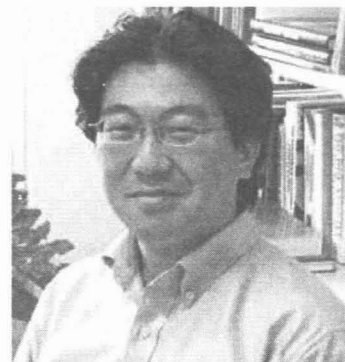
Academic teaching:

- Professor for Intellectual Property, Graduate School of Law, Nihon University

Major Publications:

- Analysis on Housing Problems in Japan and A Proposal of its Solution, 1999
- International Benchmarking of Japan's Science and Engineering Research, 2000
- The Case Studies of Successful R&D in Japanese Private Firms, 2002

Short Biography of Atsushi Sunami



Atsushi Sunami is an Associate Professor and Special Assistant for the President, President's Office at National Graduate Institute for Policy Studies, Japan. He is also a Visiting Researcher at National Institute of Science and Technology Policy (Ministry of Education, Culture, Sports, Science and Technology) as well as at Research Center for Advanced Economic Engineering, University of Tokyo. From 2004, he is a consultant for Japan Science and Technology Agency and an Advisory Member for the Honda Foundation and Okayama Institute for Quantum Physics among others.

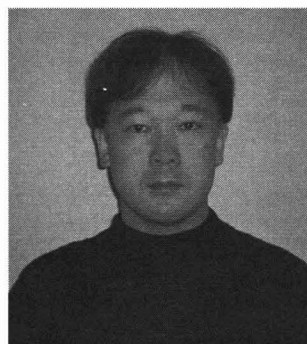
His research has concentrated on a comparative analysis of national innovation systems and an evolutionary approach in science and technology policy and public policy analysis in general.

Professor Sunami holds BSFS from Georgetown University. He obtained MIA and PhD in Political Science from Columbia University. From 2001 to 2003, he was a Fellow at Research Institute of Economy, Trade and Industry established by the METI, Japan. He also worked as a researcher in the Department of Policy Research at Nomura Research Institute, Ltd. from 1989 to 1991. He was a visiting researcher at Science Policy Research Unit, University of Sussex, and Tsinghua University, China.

September 2004

Hiroyuki TOMIZAWA

(September 2004)



NAME:

TOMIZAWA, Hiroyuki

PRESENT POSITION:

Senior Research Fellow,

National Institute of Science and Technology (NISTEP),

Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan

RESEARCH FIELD:

Science and Technology Policy Studies and S&T Indicator Development.

EDUCATION:

Graduate Division of Science and Technology, Sophia University, M.S., Physics, 1988

WORK EXPERIENCE:

- | | |
|----------------|---|
| 1988 – 1989 | Japan Information Center of Science and Technology (JICST), Electric Data Processing Division. |
| 1989 – 1996 | Researcher, National Institute of Science and Technology Policy (NISTEP), Science and Technology Agency, Japan. |
| 1992 | Visiting Researcher, International and Interdisciplinary Studies, University of Tokyo |
| 1996 – present | Senior Research Fellow, National Institute of Science and Technology (NISTEP) |

PROFESSIONAL ACTIVITIES (selected):

- | | |
|-------------|---|
| 1998 | Lecturer (part-time), College of Arts and Sciences, University of Tokyo |
| 2000 – 2002 | Member of working party of revision of Frascati Manual sixth edition (2002, OECD) |
| 2001 – 2003 | Lecturer (part-time), National Graduate Institute for Policy Studies (GRIPS) |