

The Boris Mints Institute  
for Strategic Policy Solutions to Global Challenges  
The Gershon H. Gordon Faculty of Social Sciences  
Tel Aviv University

# THE BORIS MINTS INSTITUTE

## FOR STRATEGIC POLICY SOLUTIONS TO GLOBAL CHALLENGES

### 4<sup>th</sup> Annual Report | 2019



SUSTAINABLE  
DEVELOPMENT



INEQUALITY



RENEWABLE  
ENERGY



WATER



CONFLICT  
RESOLUTION



<http://www.bmiglobalsolutions.org/>





-  **Members of BMI's Advisory Board and Academic Committee:** Russia, Germany, Luxembourg, Armenia, Bulgaria, Czech Republic, Finland, Kenya, Montenegro
-  **BMI Research:** India, NEPAL, OECD, California, Kenya, Rwanda
-  **BMI Conferences:** Finland, Malta, Georgia, Armenia, Montenegro

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# LETTER FROM FOUNDER AND PRESIDENT, DR. BORIS MINTS



**T**hroughout the whole duration of last year – the BMI Operational Lab Concept, proved to bring great progress and was a very successful implementation. We have continued our main projects, as well as started moving forward in newly discovered directions, which I personally think are tremendously important, as they will expand the circle of our academic partners. Firstly, it is the interdisciplinary analysis of global conflicts and secondly, we have just started introducing the problems of the modern global demography. As for the first challenge – we will have a very big conference in Rome, in collaboration with Link Campus University and with participation of globally prominent politicians and diplomats. I am certain that the discussion there will be of utmost significance for further scientific projects of our researchers. I would like to personally thank Professor Itamar Rabinovich for his active participation in preparation of this conference, as well as the actual scientific research.

In terms of the challenge of the global demography – we are in the very beginning of our journey. This direction is particularly important to all global structures and extensive, yet I am certain that we will be able to produce very deep and groundbreaking research in the field.

The session that BMI had in Montenegro – was a big success, researching the overall topic of Blockchain and understanding its impacts on the global processes. During the session we have heard many of the lectures in the field, that have helped the overall comprehension of the challenge and its' derivatives to further affect the world.

During the BMI Annual Session at TAU – a lot of very interesting presentations were given by members of academia as well as BMI fellows, which displayed outstanding work that we are producing. The 2019 BMI Prize was awarded to the prominent scientist – Dr. Peter H. Gleick, President Emeritus, The Pacific Institute for studies in Development, Environment and Security. The lecture given by the laureate was full of astonishing content and emerged a lot of attention from the audience. I would like to thank Dr. Peter H. Gleick again for his participation in the 2019 Annual Session of the Boris Mints Institute.

In conclusion I would like to thank the President of Tel-Aviv University – Prof. Joseph Klafter for supporting our research and the Head of BMI – Prof. Itai Sened, alongside with his team for the great work that they produce on the annual basis.

A handwritten signature in blue ink, appearing to read 'Boris Mints'. The signature is fluid and stylized, with a long horizontal stroke at the end.

**Dr. Boris Mints**

Founder and President of the Boris Mints Institute for Strategic Policy Solutions to Global Challenges

# LETTER FROM HEAD OF BMI, PROF. ITAI SENED



It has been four years since the inauguration of the Boris Mints Institute for Strategic Policy Solutions to Global Challenges thanks to the generous gift of Dr. Boris Mints. As a concept, BMI has proven itself, having a significant impact on the lives of so many. In the coming years, we will continue to expand our reach and impact to many more.

We engage the best academics we can find in conversation with the most influential decision makers and members of diverse communities around the globe, to make sure we understand the pressing issues that preoccupy them. Deeply involved in research communities at Tel Aviv University and worldwide, we apply the simple following rule: we support research that is

cutting edge on the one hand and is imminently relevant to some major challenges that the diverse communities we engage with are facing on the other hand. We support only research that matters and this is why our research matters. It is as simple as that!

This year was our 'coming of age' year. Three of our students completed their dissertations that are now under review. Our project in Kenya, supported by the Matanel Foundation, and directed by our Ph.D. student, Opher Mendelson, working with a team at ICPIE in Nairobi Kenya, headed by our academic committee member Dr. Segenet Kelemu, received significant further international funding from the Gates foundation. Originally designed to help locals combat the spread of a fruit fly ravaging the Mango crops, it has now been extended to help other villagers in Kenya deal with a similar threat to their corn fields.

Dr. Fishman's Lab working with poorest farmers in India, using advanced technology and agro-economic tools developed in Israel has gotten global attention. This project is supported by BMI, the TATA Trusts and the state Government of Andhra Pradesh is now spreading to other regions in India and Tel Aviv University is in the process of augmenting the project with a special educational program that will bring students from Tel Aviv, India, Germany and the U.S. to get academic credits through the process of creating innovative strategic programs to help the poorest farmers in the world. The initiative established an advanced R&D center and promote involvement of agricultural experts in villages and farms – so as to overcome technological, agronomic and economic barriers, to promote sustainable agriculture and food security.

Our March meeting in Montenegro was a celebration of fresh knowledge on how DLT and Blockchain technologies may bring some hope to help solve some of the most wicked problems of social management. Following the conference, a strategic pact was created with the University of Malta and with some civil organizations in Israel to continue and explore practical applications.

In Tel Aviv we have augmented our team of researchers in the Conflict Resolution lab. Following a couple of new hires, we believe we now have the best team in the world to deal with the issue, particularly geared and focused on application to the Israeli-Palestinian conflict. This team will celebrate its coming of age in our September conference in Rome, hosting some of the most prominent statemen and diplomats that ever worked in this field, engaging themselves personally in an effort to find solutions.

As always, I conclude this letter with heartfelt thanks to Dr. Mints for his generous grant to establish the Institute, and all of the researchers that have responded to our calls for proposals. Those judged to have the merit to get support and their critically important research are reviewed in this report and our debt to them is simple to characterize: we only live by their success.

**Professor Itai Sened**

Head of the Boris Mints Institute for Strategic Policy Solutions to Global Challenges  
Founding Head, School of Social and Policy Studies, Tel Aviv University in Israel

# BMI VISION

The Boris Mints Institute was founded with the intention of encouraging research, planning and innovative thinking in order to promote significant positive changes in the world. BMI is focusing on designing strategic innovative plans to enhance the welfare of communities around the globe.

The world is thirsty for innovative and groundbreaking policy solutions to promote environmental sustainability, ensure food security, health and energy to all, and eradicate poverty. Yet, there is a dearth of applied, practical, policy-directed research on these issues. BMI addresses these challenges by operating on two levels: extending research grants and scholarships to research students and organizing conferences focusing on contemporary global challenges.

BMI supports applied, practical and solution-driven research, conducted by M.A and Ph.D. students under the supervision of internationally renowned senior scientists. The Institute ensures that no good idea goes to waste due to lack of funding and brings Israeli technologies to the world's neediest populations – harnessing Israel's startup mentality in the service of humanity.

As a globally influential research institution, Tel Aviv University is committed to applying its know-how and experience toward solving real-world problems. As a result, TAU is uniquely positioned to be the home base of BMI. Yet, BMI is mostly an international organization with a very wide reach globally.

BMI's DNA requires that its innovative ideas be transferred in real time to policy makers. BMI has already held several academic events and extended significant support to research projects in food security, renewable energy and conflict resolution worldwide.

## ➤ Steering Committee



### **Dr. Boris Mints, President**

Ph.D. in Engineering. Previously the Chairman of Board of Directors of the "Otkrytie Stock Broker" OJSC. Co-Founder of "Otkrytie" Investment Group and Chairman of the Board. Founder of "O1 Group". Chairman of the Board of Patrons of the Conference of European Rabbis. Awarded the Dashkova's Prize "Philanthropist of the Year" and Honorary Fellow of Tel-Aviv University.



### **Prof. Raanan Rein, Vice President of Tel-Aviv University**

Elias Sourasky Professor of Latin American and Spanish History. Vice President of Tel Aviv University and head of the S. Daniel Abraham Center for International and Regional Studies. Rein is the author and editor of more than thirty books and well over a hundred articles and book chapters in academic publications. He is a member of Argentina's National Academy of History and former President of the Latin American Jewish Studies Association (LAJSA). In 2016, he won the Reimar Lüst Award (co-sponsored by the Alexander von Humboldt Foundation and the Fritz Thyssen Foundation).



### **Prof. Tami Ronen-Rozenbaum, Dean of the Faculty of Social Sciences at TAU**

A researcher in the field of the Cognitive Behavioural approach and Positive Psychology. Her research focuses on the function of self-control skills, positive emotions and social support as a way of overcoming stress and developing happiness. In her work, Prof. Ronen-Rozenbaum links a complex theoretical model of understanding human strengths and coping abilities to techniques for developing useful interventions in the field.



### **Mrs. Irina Buylova, Representative of BMI President**

Executive director of the Yegor Gaidar Foundation (Russia), a prominent journalist and internationally recognized expert in building effective interaction models for Russian and international NGOs-- including educational, economic and social development institutions. In the 1990s and 2000s she reported on social policy and development issues in the context of the turbulent Russian economic and political transitions.



### **Prof. Itai Sened, Head of BMI, Founding Head of the School of Social and Policy Studies, TAU**

Prof. Sened is the founding head of TAU's School of Social and Policy Studies at the Gordon Faculty of the Social Sciences. He returned to TAU after serving for 12 years as director of the Institute for New Institutional Social Sciences at Washington University, which was established by Nobel Laureate Douglass C. North. He is the founding head of the Boris Mints Institute for Strategic Policy Solution to Global Challenges and the Academic Institute for Structural Reforms. In addition, he heads the TAU Center for Renewable Energy and Evens Program for Conflict Resolution.



## ➤ International Academic Committee



### **Prof. Yossi Rozenwaks, Dean of the Faculty of Engineering, TAU.**

Prof. Rozenwaks is a leading researcher in a various fields, including nanotechnology, electrostatic force microscopy, atomic force microscopy, nanoscale charge injection in memory devices, solar cells, organic semiconductor devices, biological field effect transistors, charge carrier dynamics in semiconductors, and recombination processes.



### **Prof. Miranda Schreurs, Professor of Environment and Climate Policy, Bavarian School of Public Policy, Technical University of Munich**

Previously the director of the Environmental Policy Research Center and professor of Comparative Politics at the Freie Universität in Berlin and an associate professor in the Department of Government and Politics at the University of Maryland. Prof. Schreurs' focuses on comparative environmental politics and policy in Europe, the United States, and East Asia. She is a member of the German Advisory Council on the Environment.



### **Dr. Segenet Kelemu, Director General of the International Center of Insect Physiology and Ecology (ICIPE) Nairobi, Kenya**

Dr. Kelemu is the Director General of the International Center of Insect Physiology and Ecology (ICIPE) in Nairobi, Kenya. She is a molecular plant pathologist whose work focuses on the elucidation of molecular determinants of host-pathogen interactions, development of novel plant disease control strategies-- including genetic engineering-- biopesticides, pathogen population genetics and dynamics, and endophytic microbes and their role in plant development. She has first-hand experience with both the challenges and successes associated with African agriculture, from tending to fields to directing world-class laboratories.



### **Prof. Itai Sened, Head of BMI, Founding Head of School of Social and Policy Studies at TAU**

Prof. Sened's specializes in the study of institutions and how they affect policy at all levels. These institutions include not just formal institutions at the national and local level, but also the informal institutions which determine social norms and cultural habits and may enhance or impede economic development and social prosperity. In recent years his research has become less technical and more applied to the fields of renewable energy and institutions that protect the growing inequality in income and assets around the globe.



## ➤ International Advisory Board



### **Mrs. Joelle Aflalo, Co-Founder of the Matanel Foundation**

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A founding member and the general manager of Gestman SA, as well as a founding member of Cofidom-Gestman Sàrl, a Luxembourg based firm which specializes in corporate structuring and investment engineering. In 2006, she founded, together with Mr. Gad Boukobza, the Matanel Foundation. This charitable institution encourages social entrepreneurship and is a testament to Mrs. Aflalo's sense of responsibility, spirituality, dedication to philanthropy, and constant desire to help create a better world.



### **Prof. Armen Darbinyan, Chairman of the Board, Rector of the Russian – Armenian University, Yerevan, Armenia**

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Prof. Darbinyan is an initiator of economic and political reforms in Armenia, including the development of the private sector and the formation of new governmental institutions. He led important reforms in the fields of telecommunication, agriculture, infrastructure and tourism. In addition, he is the author of national legislation regarding banking, stock companies, anti-trust provisions, and state regulation of public services. He is renowned as an international expert on transition economies and was granted the Young Global Leader award by the World Economic Forum.



### **Dr. Simeon Djankov, Director, Financial Markets Group, London School of Economics**

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Dr. Djankov was declared "Bulgaria's Most Successful Politician" and awarded the President's Award of the World Bank. He is a visiting professor at the London School of Economics' Department of Finance and was previously a visiting fellow at the Peterson Institute for International Economics, Washington DC. In addition, he has served as Deputy Prime Minister and Minister of Finance of the Republic of Bulgaria.



### **Dr. Sergei K. Dubinin, Chairman of Supervisory Council, Chairman of the Remuneration and HR Committee – VTB Bank**

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Dr. Dubinin is an economist and professor at Lomonosov Moscow State University. In addition to positions in the Russian government, he served as chairman of the Russian Central Bank from 1995-1998. In addition, he has served on the board of governors of several banks and leading financial institutions.



### **Prof. Jacob A. Frenkel, Chairman, TAU Board of Governors, former Governor of the Bank of Israel**

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Prof. Jacob A. Frenkel serves as the chairman of the TAU Board of Governors and chairman of JPMorgan Chase International. In addition, he serves as Chairman of the Board of Trustees of the Group of Thirty (G-30), a private, non-profit, consultative group on international economic and monetary affairs. In addition to filling executive positions for international investment and financial services companies, Prof. Frenkel is also the former head of the Bank of Israel.



### **Prof. Václav Klaus, Former President of the Czech Republic, Head of the Václav Klaus Institute**

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An economist by training, Prof. Klaus was forced out of the Czechoslovak Academy of Sciences after the Soviet invasion in 1968. He returned after the Velvet Revolution of 1989 as one of the founders of the Civic Forum Movement. He was the country's first non-Communist Finance Minister and served from 1992 to 1997 as Prime Minister of the Czech Republic. In 2003 Klaus was elected President of the Czech Republic and won reelection in 2008. Since 2012 he has headed the institute which bears his name, a think tank based in the Czech Republic. He is a member of the Mont Pelerin Society, has published more than 30 books, and is the recipient of numerous honorary degrees and international awards.



### **Dr. Igor Luksic, Former Prime Minister of Montenegro, South East Europe Public Sector Director, PwC**

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Dr. Luksic was an official candidate for the position of UN Secretary General in 2016 and served as Prime Minister of Montenegro from 2010-2012, Deputy Prime Minister and Minister of Foreign Affairs and European Integration from 2012-2016, Minister of Finance from 2004-2010, Member of the Parliament of Serbia and Montenegro from 2003-2006 and Member of the Parliament of Montenegro from 2001-2003. Today, Luksic is the south-east Europe public sector director of PwC. Dr. Luksic holds a Ph.D. in economics and is an associate professor at the University of Donja Gorica Podgorica (UDG). Dr. Luksic is an advocate for transparency and dialogue in a proactive approach to both internal and foreign relations. During his time as Prime Minister, Montenegro opened accession talks with the EU and completed accession to the WTO.



### **Prof. Itamar Rabinovich, Founder and President of the Israel Institute, Former Ambassador of Israel to USA and President Emeritus of TAU**

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Prof. Itamar Rabinovich is the president of the Israel Institute (Washington and Jerusalem), Israel's former Ambassador to the United States and the former president of Tel Aviv University (1999-2007). He is professor emeritus of Middle Eastern History at Tel Aviv University, Distinguished Global Professor at NYU and a Distinguished Fellow at the Brookings Institution. Prof. Rabinovich has been a member of Tel Aviv University's faculty since 1971 and served as the Ettinger Professor of the Contemporary History of the Middle East, chairman of the Department of Middle Eastern Studies, director of the Dayan Center for Middle Eastern and African Studies, Dean of the Humanities Faculty, and Rector.



### **Dr. Seppo Remes, Co-Founder and Chairman of the Board, EOS Russia**

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Dr. Remes is a Finnish citizen and holds a Licentiate of Economics degree from the Turku School of Economics. Working in Russia from 1993-2015, he is the former CEO of the Investment Company Vostok Energo and director of Vostok Nafta, both of which operate in the Russian energy sector. He was selected as the Director of the Year in 2013 by the Independent Directors' Association and the Russian Council of Industrialists and Entrepreneurs. In 2007 he was among the founders of the EOS investment firm and has been company chairman since its inception. He was awarded an honorary Doctorate from the Plekhanov Academy of Economics in Moscow and Turku School of Economics in Finland.

## ➤ Management



### **Prof. Itai Sened, Head of BMI, Founding Chair School of Social and Policy Studies at TAU**

Founding head of TAU's School of Social and Policy Studies at the Gordon Faculty of Social Sciences. He recently returned to TAU after serving for 12 years as director of the Institute for New Institutional Social Sciences, which was established by Nobel Laureate Douglass C. North.



### **Dr. Alexander Pesov, Representative of BMI President**

Dr. Pesov hold a Ph.D. in biology and is the author of several scientific publications. Dr. Pesov has previously worked as a journalist, writer, and editor of several top journals and newspapers and served as vice president of the International Press Center in Moscow. From 1998 to 2012 Dr. Pesov was an advisor to the prime minister of the Russian Federation Eugene Primakov, chief of staff of the Ministry of Agriculture of the Russian Federation and vice governor of the Voronezh region.



### **Dr. Haim Ben-Yaakov, Representative of TAU President**

Ben-Yaakov is a senior executive for regional development and public affairs at Tel Aviv University. He served as CEO of the Euro-Asian Jewish Congress, head of the Jewish Agency for Israel in Russia and the Baltic States and as an educational adviser for the Jewish Agency for Israel.



### **Ayelet Fishman. Adv., Administrative Director of BMI**

Fishman received her LL.B. from the Hebrew University in Jerusalem as well as an M.A. in Public Policy, with distinction, from Tel Aviv University. She formerly served as the Israeli Ministry of the Interior's National Elections Supervisor.

## ➤ Sustainable Development Lab

In collaboration with the Manna Center Program  
for Food Safety and Security



Manna Center Program  
for Food Safety & Security  
Tel Aviv University



**Lab Head:** Dr. Ram Fishman, Department of Public Policy\*

**Opher Mendelsohn, Graduating BMI Fellow**

**Academic Advisor:** Dr. Ram Fishman, Department of Public Policy

### Combating the Mango Fruit Fly in Kenya

In Collaboration with ICIPE and the Matanel Foundation



Opher Mendelsohn with ICIPE staff in Kenya

BMI's Sustainable Development Lab is bringing agritech and advanced practices to the poorest corners of the world in order to fight pests and diseases that damage crops. BMI's cooperation with ICIPE, the prominent research institute in Kenya, is sponsored by the Matanel foundation. Together, they have launched a joint research project that focuses on combating the oriental fruit fly. This project promotes both low and high technology solutions, but stresses that these solutions must be adjusted to local conditions. The project implements Integrated Pest Management (IPM), in which pesticide use is minimized in manner that finds the proper balance-- technically, environmentally and economically. Concerns over profit, risk management, environment and health issues, and human pride challenges the adoption of the IPM. As a result, it is all the more crucial to work closely with the local population. The project has several objectives: (1) Dissemination of a sustainable solution for the problem of the oriental fruit fly in mango orchards in Elgeyo Marakwet County, Kenya (2) Capacity building of the local extension service (3) Increasing regional cooperation (4) Assessing the impact of adopting the new practices.

Insights gleaned from this project are already being put to use in an additional project for regional management of the fall armyworm. The fall armyworm is an invading pest that causes devastating losses to maize, Africa's primary staple crop. This project, financed by the Bill and Melinda Gates foundation, is a cooperative effort of Tel Aviv University and ICIPE in various counties around western Kenya.

These projects not only aim to promote a change in farming practices, but to dramatically improve the life of Kenyan farmers and their families.

\* Dr. Ram Fishman has received substantial grants from the Gates Foundation, London School of Economics, Rothschild Foundation and the Jewish Funders Network for extensive research and field work in India in order to promote a better future for the region.



## Yoav Rothler, Graduating BMI Fellow

**Academic Advisor:** Dr. Ram Fishman, Department of Public Policy

### Impact of Drought on Farmer Suicides



In the past year Mr. Rothler studied the socio-economic impact of irrigation usage on farmers. In particular, he analyzed the connection between irrigation cover rates and farmer suicide rates. The results of his research indicate that a higher rate of irrigation is directly related to lower farmer suicide rates. In contrast to this, irrigation cover does not have any significant relationship to suicides among other occupational groups. This provides strong evidence that the effect of irrigation cover on suicides is driven by factors related to farming. Further analysis reveals that most of the demonstrated effect is related to variation in canal irrigation cover, rather than well irrigation. This distinction is important because canal irrigation is more favourably distributed among small and marginal farmers, while well irrigation is more advantageous to larger farmers. The fact that canal irrigation is more strongly correlated with farmer suicide may therefore indicate that smaller farmers are more affected by variation in irrigation cover. Mr. Rothler's analyses other potential causes of farmer suicide, such as debt. While this work is still in progress, initial results indicate that the effects of such controlling variables on suicide rates are limited and do not alter the statistical significance of the irrigation effect. All this adds upon previous research carried out by Mr. Rothler in the academic year of 2017-18 which showed that droughts have a strong causal impact on farmer suicides in India. Further, this earlier study demonstrated that economic mechanisms in the form of irrigation cover form a significant connection between the two.

## Yalon Perlman, BMI Fellow

**Academic advisor:** Dr. Ram Fishman, Department of Public Policy

### BMI-TATA Collaboration Operation Project



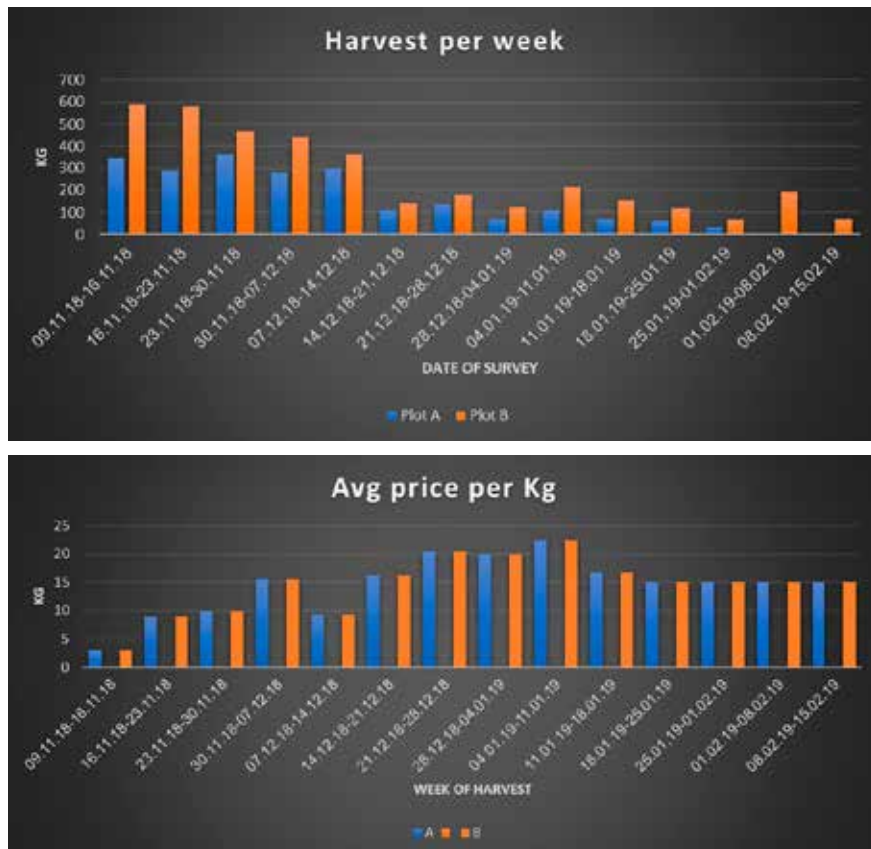
This study examines the economic impact of various farming technologies through field experiments. The results challenge the assumption that crop increases bring a correlating increase in a farmer's revenue. Further, the work includes an index of the various difficulties encountered when conducting field experiments in an agricultural field as opposed to a demonstration farm. Often NGOs in developing countries do not adequately integrate academic research into their projects. Hence, an addition goal of this project is to show how academic studies can aid in determining ideal resource allocation and developing a plan of action for the target population chosen by a given NGO.

The field experiments were conducted in various locations in the Andhra Pradesh region of India and with various different field crops (see photo below). The data was collected by means of a survey system built by the laboratory staff which collected relevant information before the preparation of the land and through to planting and the eventual sale of produce. The results of this survey allow for a comparison between the experimental group in which technology is applied and a control group wherein the farmer operates as normally would. This comparison rendered many interesting results (see graphs below). For example, due to the structure of the market in these areas, which are characterized by a lack of information regarding the brokers and the dealers, there is a huge variation in the prices that the farmers received for what they produced. Therefore, despite the success of the experimental group in increasing the crop output, the net profit of the farmers often did not increase proportionally.



Eight agro-economic experiments were conducted, completed and analysed in order to measure the economic and agronomic impact of basic technologies such as drip irrigation and yellow mulching, together with agronomical advice and PoP (Package of Practice) given by Israelis and Indian experts. For the sake of the experiment, a given farmer's land was divided into two plots – intervention and control – and monitored weekly. This field study provided important insights that will aid farmers in the coming season. On the water conservation front, a two-year tech pilot program with Tal-Ya Agricultural Solutions (an up-and-coming Israeli agritech company) was initiated, employing

a multi-use soil cover that that directs water and fertilizer straight to the root, while likewise protecting the earth around the root from weeds and extreme temperatures.



Control Plot vs. Experimental Plot

## Karel Finkelstein and David Shurman, BMI Fellows

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**Academic Advisor:** Dr. Ram Fishman, Department of Public Policy

### Breaking New Ground in Indo-Israeli Agricultural Technology Transfer

Currently, the pilot program focuses on orchards and involves six farmers in the Anantapur district-- one of the driest areas in India. Though it is too early to determine whether the tool is successful, preliminary results are promising. Though the pilot is focused on trees, an additional experiment was conducted with a tomato farm in the Krishna district. In this experiment the Tal-Ya plot yielded more than three times the amount than the control plots. As a result, the student researchers are currently making plans to expand the experiment to vegetables in the next cycle. This has the potential not only to benefit farmers by saving water and increasing yield, but it will also have a positive impact on the environment. Tal-Ya's product is meant to last ten years and is recyclable-- allowing farmers to substantially reduce the use of single-use plastic.

In addition, the research group recently concluded its first post-harvest tech-pilot. Post-harvest solutions are important as crops often suffer substantial damages after being harvested, but before being sold. The Israeli argitech company Amaizz attempts to provide cheap post-harvest tools that minimize the losses caused by crop spoilage and degradation throughout the handling, storage, and processing stages. However, over the course of this pilot program it became clear that Amaizz's products failed to achieve their stated goals. Regarding the dairy market, a large baseline survey was completed (1015 animals) in order to lay the groundwork for projects which aim to increase the productivity of smallholder cattle farms. Such projects have the potential to improve food security and add much needed sources of income. Lastly, the students are currently running an experiment in the Chittoor district which tests the effectiveness of integrated pest management systems (IMP). IPM utilizes a wide range of practices to achieve economic pest control with the least possible disruption to agro-ecosystems. These systems are being used in the hope protecting smallholder farms from the devastating effects of the oriental fly on Indian mango orchards.





**Lab Heads:** Prof. Dror Avisar, Head of TAU Water Center, Faculty of Exact Sciences and Prof. Hadas Mamane, Head of the Environmental Engineering Program, Faculty of Engineering

**Patricia Akao, BMI Fellow**

**Academic Advisors:** Prof. Dror Avisar and Prof. Hadas Mamane

## Microalgae Utilization for Removal of Organic compounds from Wastewater: Circular Economy Concept



Preliminary experiments utilizing microalgae *Chlorella* sp. to remove iodinated contrast media (ICM) showed great potential and as a result new experiments were performed over the course of 27 days, in triplicates. The positive and negative controls were performed in duplicates for each specific concentration (2, 5, 10 and 100 mg/L Iohexol – IHX). The presence of IHX did not affect the culture growth, as shown in Figure 1.

Deducting the abiotic removal, the microalgae removed 31%, 34% 33% and 26% of the IHX available at the medium for IHX initial concentration of 2, 5, 10 and 100 mg/L, respectively (as shown in the graph below). The abiotic removal presented rates between 5-13 % depending on the initial concentration. This variance may be due to intense light applied 24 hrs a day during the experiment. A control experiment in darkness is in progress in order to test this hypothesis.

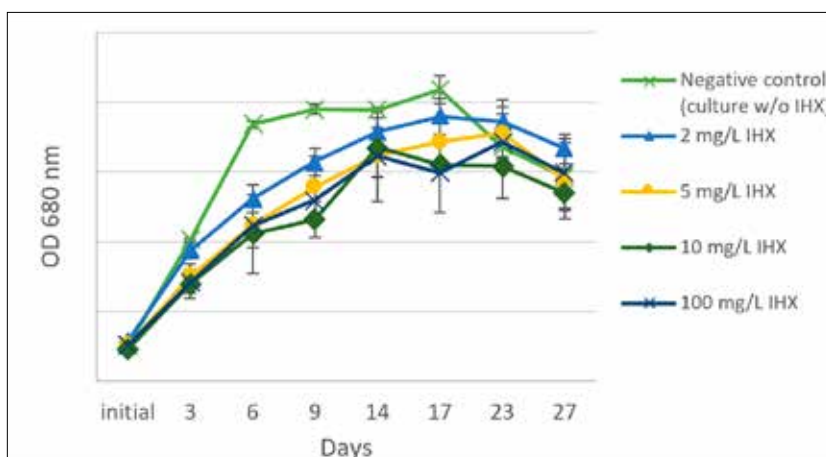
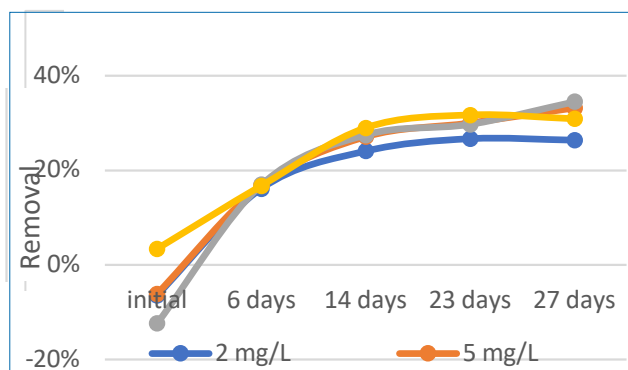
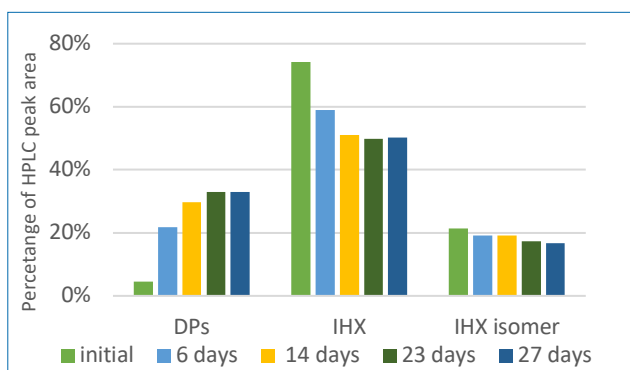


Figure 1: Culture growth during 27 days of experiment

These experiments show that the IHX concentration decreased in the medium while the degradation products (DPs) increased. By day 27, 33% of the total peak area belonged to the DPs. Analysis of HPLC-MS was performed in order to



Figures 2,3: IHX removal at the positive control, 2, 5, 10 and 100 mg/L IHX deducting the abiotic removal **b)** HPLC peak area of the IHX, IHX isomer and DPs of 2 mg/L

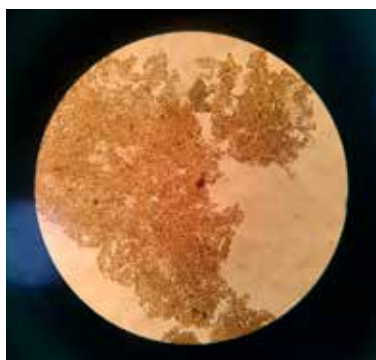
characterize the IHX DPs. Nine of the highest concentration DPs were chosen to study their possible structures. Another experiment was conducted with a phosphate buffer of pH 8.5, containing 50 mg/L of IHX and ozonised for 2, 5, 10 and 20 minutes. The samples were likewise analysed by HPLC-MS. The experiment showed that the microalgae may release an enzyme capable of oxidizing the IHX molecule. Ongoing research aims to better understand the oxidation pathway and characterize all nine DPs chosen. Further experiments are planned for next year.

## Adi Zilberman, BMI Fellow

**Academic Advisors:** Prof. Dror Avisar, Prof. Hadas Mamane and Yaal Lester, Environmental Engineering, Azrieli College, Jerusalem

### Removal of Micro-Pollutants from Hospital Wastewater

It was expected that the removal of carbon, phosphorus and nitrogen from hospital wastewater will be carried out by the biological activity of the aerobic, anoxic and anaerobic bacteria, and that in the first stage the drugs under investigation will not be dismantled. After adding ozone to the system, however, the bonds between the molecules of the drugs will break. By cutting the molecules and returning them back to the chambers where the biological activity will occur, the bacteria will then dispose of the residues of the drugs and the drugs will be removed from the effluents. The study included the development of extraction methods, analytical identification of organic micro-pollutants (chemotherapeutic agents), as well as examinations of the efficiency of decomposition. The advanced treatment technologies that will be utilized in the research include: multi-stage biological decomposition including carbon, phosphorus and nitrogen reduction in ventilated, semi-ventilated and non-ventilated chambers, and physical removal by ceramic membrane and advanced ozone oxidation. At the last lab batch experiment, Ms. Zilberman used



A photo from the microscope. Bacteria types vary from nematode, filaments, Crown ciliatea, Attached ciliatea- all are a good sign for the wastewater quality.

secondary sludge from a Wastewater Treatment Municipal Plant with hospital wastewater from Tel Hashomer hospital. She is now working to scale-up the project by creating the required bacteria colony inside the hospital reactor and starting the acclimation of the bacteria to these highly toxic wastewaters. Ms. Zilberman discovered that the wastewater is nutrient poor and therefore there is a need to add iron, phosphate and a carbon source into the mix to help the bacteria grow. The photo here shows the bacteria colony which is comprised of several types of bacteria. This is a good sign for the wastewater quality. The next stage of the research will be to start with ozone experiment at the pilot site.

# ➤ Middle Class Studies and Inequality Lab

In collaboration with the Academic Institute for Structural Reforms



**Lab Head: Prof. Itai Sened**, Head of the School of Social and Policy Studies and Head of BMI

**Sagit Azari Viesel**, Graduating BMI Fellow

**Academic Advisor: Prof. Itai Sened**, Head of the School of Social and Policy Studies and Head of BMI

## The Institutional Political Economy of the Middle Class in Developed Countries



Following the financial crisis of 2007-2008 the strengths and vulnerabilities of the middle class have come to the forefront of discussions on economic recovery. Despite this growing interest in the middle-class, rigorous scholarship on the subject is sparse. This neglect may be connected to the nature of the standard method used by most economists to measure the strength of the middle-class. Almost invariably, economists make use of different cut-points of income distributions. There is virtually no existing theory to explain how the economic imperatives of the middle-class act as an engine for long-term economic growth. Ms. Azari Viesel has developed a set of statistical tools to study the middle-class as a subset of the population which benefits from a bundle of privileges that protect their access to education, health, housing, pension funds and other assets. This makes it possible to form a set of expectations and values that explain their pattern of behaviour. The Latent Class Analysis (LCA) model which Ms. Azari Viesel developed has unique advantages-- it allows the use of multiple factors to co-define the middle-class and tests the importance and the precise effect of each one. This is critical because a social class is an underlying and latent construct that is not observed directly. Her research focused on three countries: Israel, the United Kingdom, and Italy. The results indicated a significant change in class structure, to a more polarized class stratification. Ms. Azari Viesel also found that what distinguishes the poor from the middle class are quality employment, education, real estate, pension, and health care. These conclusions notwithstanding, there is a significant variance across the cases studied. Her approach enabled the analysis of the class divisions in each country to properly understand the unique characteristics of each group and allow policy makers to tailor solutions to each group. In Israel, for example, the core middle-class does not need more housing (though the new middle-class does), but rather a labour market more accessible to members of the middle- and low-classes. Further, the Israeli lower class must develop skills that are applicable to the modern labor market. In contrast, in Italy the lower class, first and foremost, requires new and unique incentives to enter the labor market. Finally, in the UK, the most pressing matter is the fact that the education system has actually left the middle-class wholly unequipped to meet the needs of current labor markets.

## Eve Guterman, BMI Fellow

**Academic Advisor:** Professor Itai Sened, Head of the School of Social and Policy Studies and Head of BMI

### Wicked Problems in the Information Age: Decentralizing for Equality



The success of globalization, primarily due to the rise of the knowledge society, has improved the quality of life for millions of people around the world while simultaneously creating new problems on a scale never before experienced. Global financial instability, climate change, the degradation of shared natural resources, increasing global and domestic inequality, migrant labour and refugees, governance and structural reform – these issues are uniquely systemic and cannot be solved by the familiar tools that have worked in the past. The global economy is experiencing a momentous structural shift-- away from natural and financial capital and towards

the high value intangible human capital which Mason calls “cognitive capital.” Along with this shift has come a new breed of rent seeking and top-down exploitation. In other words, the information age is exacerbating the classical ‘wicked problems’ of capitalist society, rather than simplifying or solving them. With that, it provides new institutions and offers new solutions. The information age makes it possible to implement equitable and individual-oriented policies considered impossible until now. As a result, the information age desperately requires new institutional arrangements and models for understanding and maximizing so-called cognitive information capital. This is certainly the case if we wish to craft an equitable future, rather than a return to Feudalism.

The following research questions will be evaluated in Ms. Guterman’s study.

1. Can we decentralize our existing institutions or create new decentralized institutions in order to adapt to the information age?
2. Can we use technology to solve the age-old problems of capitalism, or at least mitigate the damage done?

In our current reality institutions for the redistribution of wealth are increasingly defunct and ineffective. The protection of property rights via collective action results in unsustainable environmental exploitation and persistent information asymmetries result in the exploitation of individuals, particularly when it comes to the commodification of personal information and data. Further, the institutions of capitalism have placed the rights of corporations above the rights of its citizens, commodifying labour without adequate social protections-- resulting in what Stiglitz calls the “race to the bottom”.

This study aims to show that technological design solutions can be found to these persistent coordination problems using Blockchains and other Distributed Ledger Technologies (DLTs). Each case will be based on the implementation and analysis of a coded pilot, taking into consideration both design principals and mechanisms informed by the vast literature on the subject of the wicked problems.

# ➤ Conflict Resolution Lab

In collaboration with the Evens Program  
in Mediation and Conflict Management and  
the Academic Institute for Structural Reforms



The Evens Program in Mediation  
and Conflict Management  
The Gershon H. Gordon  
Faculty of Social Sciences  
Tel Aviv University



**Lab Head:** Dr. Sami Miaari, Faculty of Social Sciences

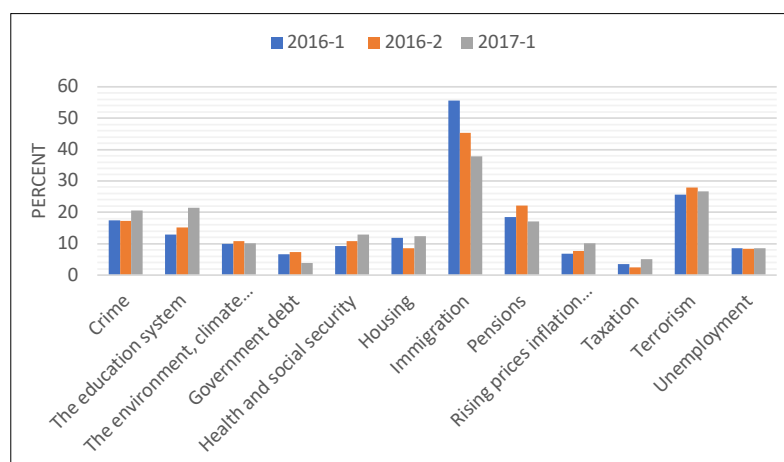
Karen Umansky, BMI Fellow

**Academic Advisor:** Prof. Itai Sened, Head of BMI

## While German Shepherds were Sleeping: How Mainstream Parties Created a Fertile Ground for the Electoral Success of the German Radical-Right AfD



This research sheds light on the resurgence of radical populism in contemporary European democracies, focusing on the 2017 German elections. Umansky demonstrates the manner in which AfD mobilized voters and gained their support by presenting them with a 'legitimate' enemy alleged to pose an ethnic and cultural threat to the German people. The concept of a 'legitimate' enemy is advanced by Umansky and Spektorowski (2017) as a mass mobilization strategy of modern radical populists in Europe. By embracing the politics of conflict an enemy is created in the minds of voters. A mutually exclusive friend-foe distinction is created and legitimized among the electorate creating an association between the alleged enemies and public concerns. Ms. Umanski investigates this mobilization strategy by using a high-frequency word discourse analysis of the most salient issue-related words in the 2017 election party platforms.



Top public concerns in Germany 5/2015-5/2017

Source: Eurobarometer Interactive (displays only concerns scoring over than 5 percent)

She then maps parties' positions on the most prevalent issues by categorizing their references to the matters into a (+) positive, (n) neutral and (-) negative trichotomy according to the meaning of the context in which they were used.

According to the results, five out of the six parties that were victorious in the 2017 election and gained seats in the Bundestag highlighted the traditional issues of economy and unemployment and almost completely ignored the two most pervading public concerns on the eve of the election – immigration and terrorism. The 2017 German election is thus a case of severe disconnect between the public and its representatives. Although the economy and unemployment were no longer key public concerns, parties chose these issues as the two main dimensions in their platforms. References to terrorism, the second largest public concern, were very low among these parties. Only one party placed an emphasis on the matter of immigration and gained a clear dominance regarding the issue – the radical-right AfD. Ms. Umansky posits that the combination of the 2015 refugee crisis and the political elite's avoidance of the issue created a window of opportunity for the radical right-wing party not just to enter the political arena but also to establish its dominance over the newly introduced dimension of public discourse. In keeping with the theoretical speculation, a party does so by framing immigrants as a 'legitimate' enemy, responsible for growing levels of crime and terrorism.

### Amit Loewenthal, BMI Fellow

**Academic Advisors:** Dr. Sami Miaari, Department of Labor Studies, and Prof. Itai Sened, Head of the School of Social and Policy Studies and Head of BMI

## The Political Economy of the Israeli-Palestinian Conflict



This research provides insight into the role economic inequality and other economic conditions play in political conflicts. Many political conflicts, both violent and non-violent, from the Arab Spring to the Brexit, are attributed to economic grievance. A global phenomenon has developed: political radicalization in an environment of rising intra-country inequality and economic resentment by people who feel left behind. However, existing studies focus on cross-country analysis and do not study the effect of economic inequality on political radicalization. This is the first research project

to address these issues. Mr. Loewenthal has analysed the conflict-inequality nexus within the scope of a single political entity, using the Israeli-Palestinian conflict (IPC)-- one of the longest lasting political conflicts-- as a case study. Using a unique combination of datasets on Palestinian socioeconomic condition and public opinion, the research explores the relationship between economic conditions and political preferences of Palestinians regarding the IPC. In a recent publication Mr. Loewenthal, and his academic advisor, Dr. Sami Miaari found that political violence during the second Intifada both caused more Palestinian women to enter the workforce and decreased the gender wage gap. This was especially true regarding middle-income occupations with an already existing large share of female employees. The change in employment numbers was due to displacement of male political prisoners from the labor force, while the change in the wage gap may be due to increased supply of low-skilled men who previously worked in Israel and now entered the local labour market due to the Intifada.

#### A forthcoming publication by Amit Loewenthal on this subject:

Loewenthal, Amit, and Sami H Miaari. *Male-Female Wage Differential in the West Bank: A Gender-Based Analysis of the Israeli-Palestinian Conflict*. Manuscript submitted for publication, 2019.



## Jesse R. Weinberg, Carl Yonker, BMI Fellows

**Academic Advisor:** Professor Eyal Zisser, Vice Rector of Tel-Aviv University

### Gaza Marshall Plan



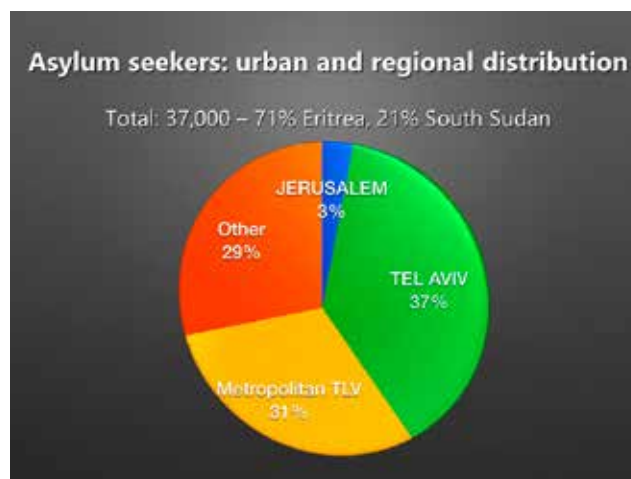
Following the work of Mr. Loewenthal, BMI fellows were tasked with providing historical, geopolitical, and analytical perspectives on political violence, reconstruction, and post-conflict development. In addition, they have offered medium- and long-term policy recommendations for Gaza's reconstruction. A draft of this so-called Gaza Marshall Plan was submitted in April and revised by May. A chapter on the history of political violence in the Palestinian national movement will be submitted shortly.

## Nora Meissner, BMI Fellow

**Academic Advisor:** Prof. Adriana Kemp, Chair, Department of Sociology and Anthropology

### Refugees in Town: Assessing the “Local Turn” of Forced Migrants’ Integration

This research project examines the political process which constitutes the “local turn” in migration policy-making. Ms. Meissner has carried out an analysis of the institutional relations between state and city and the local logics of intervention and incorporation in Tel Aviv. The project aims to offer an in-depth understanding of the dynamics that shape the particular process of rescaling. It focuses primarily on the education system, social services, health care provision, and legal advocacy. The findings suggest that the dynamics of urban restructuring in Tel Aviv made the city neither a sanctuary nor a subcontractor. Rather, it is possible to observe a ‘trade-off’ between the local and the national, between institutional relations and logic of action. The work done by this BMI fellow identified various ways in which the local institutional infrastructure was reconfigured. First, organizational expansion, institutional hybridization, and policy upscaling all lead to greater involvement of national actors. This stands in contrast to the aim of restrictionist policies which attempt to diminish the scope of unauthorized migration. Second, in regard to the underlying logic of action it was found that exclusionary control policies have not undermined the scope of local



Asylum seekers: urban and regional distribution



policies of incorporation. However, they have radically changed the Tel Aviv municipality's logic of action from a proactive paradigm of "community empowerment" to a reactive one of "emergency" and "risk management". Indeed, municipal actors have used the notion of emergency as a form of resource procurement and mobilization. Once the emergency mindset permeates the modes of operation of local organizations and their relationship to migrants it operates as a particular form of inclusion and as means for negotiating the terms of inclusion and further legitimizing it. Going forward, Ms. Meissner seeks to expand the analysis of the use of the "emergency" logic of action not just in Tel Aviv, but across Israel.

**Ms. Meissner has contributed to the following publication:**

A. Kemp (2019) "Urban citizenship in times of emergency: the impact of national control policies on the incorporation of precarious migrants in Tel Aviv/Jaffa". In T. Caponio, P. Scholten and R. Zapata-Barrero (Eds.) *The Routledge Handbook of the Governance of Migration and Diversity in Cities*, Routledge (pp. 329-343).

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## **Dr. Nimrod Rosler and Prof. Daniel Bar-Tal**

### **Resolving Intractable Conflicts**

For the first time in the last 20 years support for a two-state solution to the Israeli-Palestinian conflict has dropped below 50%. In tandem the alternative of a one-state solution is growing in popularity. It is clear that innovative approaches are needed in order to break the cycle of violence-- as past experience shows that intractable conflicts are in fact solvable. Dr. Rosner's research suggests an innovative approach, looking at an often-ignored aspect of the conflict: gender. In doing so he also takes into account previous work by Prof. Bar-Tal who argues that there are two narratives concerning the Israeli-Palestinian conflict which fight for dominance: one which sees the conflict as never-ending and unsolvable and one which values compromise and sees peace as possible. Using data collected as part of the monthly Peace Index surveys leads to the conclusion that women are more likely to support peace negotiations and political compromise. Regarding support for the Oslo Accords, the more Israel is entangled in conflict the more pronounced the difference between women and men becomes. In fact, after rigorous examination of each month's data, including regression analysis to account for political and religious affiliation, it became evident that the difference between genders was much more frequent after 2001-- the period of the Second Intifada. The conclusion is that in intractable conflicts women support a peace agreement slightly more than men. Nevertheless, the socio-cultural and geopolitical context is tremendously important for fully understanding the correlation.

**A forthcoming publication by Dr. Rosler:**

Nimrod Rosler and Nyla R. Branscombe, "Inclusivity of Past Collective Trauma and its Implications for Current Intractable Conflict: The Mediating Role of Moral Lessons," *British Journal of Social Psychology* (2019).

# ➤ Renewable Energy Lab\*

In collaboration with the Renewable Energy Center



**Lab Heads:** Prof. Yossi Rozenwaks, Dean of the Faculty of Engineering, and Prof. Abraham Kribus, Faculty of Engineering

## Assaf Hochman, Graduating BMI Fellow

**Academic Advisors:** Prof. Pinhas Alpert, Department of Earth Sciences, and Prof. Hadas Saaroni, Faculty of Exact Sciences

### Analysis of Large-Scale Climate Time-Series and their Downscaling over the Eastern Mediterranean

Mr. Hochman's research demonstrates that local dimension and persistence, derived from reanalysis and CMIP5 models' daily sea-level pressure fields, can serve as an objective quantitative method for evaluating the predictability of different Synoptic Classifications (SC). These metrics, combined with the SC transitional probability approach, are shown to be valuable to operational weather forecasts and climate model evaluation. This perspective can be extended to other geographic regions. By the end of the 21st century the duration of the synoptic summer, characterized by the occurrence of the Persian Trough, is expected to lengthen by 49%, while the synoptic winter, characterized by the occurrence of the Cyprus Low, is expected to shorten by 56%. This may lead to substantial changes in the hydrological regime and water resources, reduce the potential of dry farming, increase the risk of fires and air pollution, and change the timing of seasonal health hazards. A general increase in seasonal mean temperature is projected-- with peaks around 2.5°C-- especially in winter and autumn. The projected reduction in seasonal precipitation is not due only to a decrease in rain-bearing systems frequencies, but also to a decrease in average precipitation intensity. The areas in Israel with the largest reductions in seasonal precipitation are found over the central mountains, Mediterranean coast, and Sea of Galilee and stands to influence the main fresh water aquifers and reservoirs of Israel. The results of this study can serve as a basis for priority setting and policy solutions to improve climate adaptation and regional cooperation.

#### Recent publications by Assaf Hochman:

**Hochman A**, Alpert P, Harpaz T, Saaroni H, Messori G. 2018. A new dynamical systems perspective on atmospheric predictability: eastern Mediterranean weather regimes as a case study. *Science Advances* (in press).

**Hochman A**, Alpert P, Kunin P, Rostkier-Edelstein D, Harpaz T, Saaroni H, Messori G. 2019. The dynamics of eastern Mediterranean cyclones in the 21<sup>st</sup> century. *Climate Dynamics* (under review).

**Hochman A**, Harpaz T, Saaroni H, Alpert P. 2018. The seasons' length in 21<sup>st</sup> century CMIP5 projections over the eastern Mediterranean. *International Journal of Climatology*, **38(6)**, 2627-2637. DOI: 10.1002/joc.5448

\* The BMI Renewable Energy Lab, in cooperation with the International Institute for Applied Systems Analysis and Dr. Vered Blass, Porter School of Environmental Engineering, received a research grant from the Israeli Ministry of Environment for an amount of 65,000 USD.

**Hochman A**, Kunin P, Alpert P, Harpaz T, Saaroni H, Rostkier-Edelstein D. 2019. Statistical down-scaling of seasonal precipitation over Israel for the 21<sup>st</sup> century, using CMIP5 projections. *International Journal of Climatology* (Accepted pending minor revisions).

**Hochman A**, Mercogliano P, Alpert P, Saaroni H, Bucchignani E. 2018. High- resolution projection of climate change and extremity over Israel using COSMO-CLM. *International Journal of Climatology* **38(14)**, 5095-5106. DOI: 10.1002/joc.5714

## Hadar Traugott, BMI Fellow

**Academic Advisors:** Prof. Alexander Liberzon, School of Mechanical Engineering and  
Dr. Alexander Golberg, Porter School of Environmental and Earth Science

### Intensified Off-Shore Production of Biomass (Macro-Algae) for Bio-Energy: Mixing and Nutrients Transport Studies

Cultivation of marine macro-algae is a potentially sustainable resource for fuel, food, and chemicals. This study focuses on the effect of turbulent hydrodynamic conditions on the metabolism of *Ulva* species macro-algae, which is known for its high potential yields, protein, and carbohydrate content. Previous research has shown that the hydrodynamic conditions are a fundamental factor influencing macro-algae growth rate and chemical composition. Water motion can apply mechanical forces on the algae and cause mechanical stimulation to metabolic reactions. In plants this mechanical stimulation is known to affect growth rate, development, biochemical, and biophysical properties. Therefore, knowledge of the effect of turbulent hydrodynamic conditions is critical for designers of algae production systems in order to maximize growth -- optimizing algae quality and minimizing the negative environmental effects and cost. The first step is to quantify the impact of turbulent intensity levels and to identify algae length scales in which turbulence influences algae metabolism. To do so, an oscillating grid apparatus was adjusted for macro-algae cultivation. The turbulence under the oscillating grid depends on various parameters and changing these parameters allows one to examine free-floating algae movement and growth rates under different intensity levels and length scales. The movement of free-floating *Ulva* tissue was then tracked to assess the mechanical stimuli resulting in the algae movement. Eighteen small bright particles (9 from each side) were attached to a known size of *Ulva* tissue and the particles were photographed on four cameras, tracking their trajectories using a 3D-PTV method (Particle Tracking Velocimetry). An algorithm was likewise written to combine the nine trajectories into a 3D depiction of the motion of the algae surface under the grid (figure 1).

Future research will focus on performing cultivation experiments under different levels of turbulent intensity. Growth rate, protein, and carbohydrate content will be measured, and the results will be correlated with the turbulent

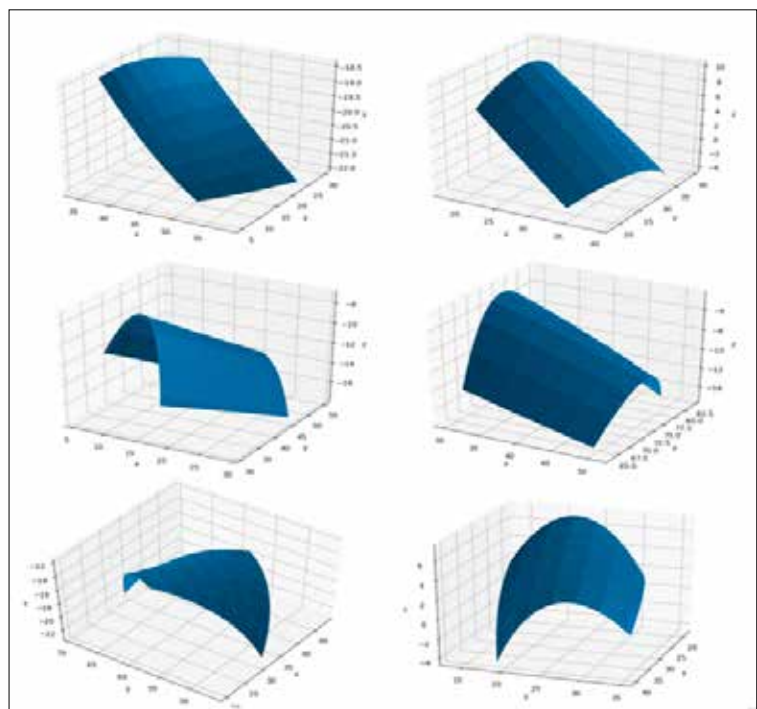


Figure 1: Different positions of free-floating *Ulva* tissue as it was tracked by the 3D-PTV algorithm under the oscillating grid apparatus

intensity levels, turbulent length scales, and mechanical stress. The information garnered from this study will provide information that will allow for the energy efficient and economical design of macro-algae production systems.

#### Recent publications from Hadar Traugott:

Ingle, K.N., **Traugott, H.**, Golberg, A. "Considerations required for the extension of large-scale, marine macroalgal cultivation in India" – Submitted for a second review to Botanica Marina.

Zollman, M., **Traugott, H.**, Chemodanov, A., Liberzon, A., Golberg, A. "Assessment of deep-water nutrient supply for an offshore *Ulva* sp. cultivation project in the Eastern Mediterranean Sea"- Submitted for a second review to Energy conversion and management.

**Traugott, H.**, Zollman, M., Cohen, H., Chemodanov, A., Liberzon, A., Golberg, A. "Aeration and nitrogen modulate growth rate and chemical composition of green macroalgae *Ulva* sp. cultured in a photobioreactor" – Submitted for review to Algal Research

### Gil Barnea, BMI Fellow

**Academic Advisor:** Professor Itai Sened, Head of the School of Social and Policy Studies and Head of BMI

## The Third Energy Revolution: Regulatory Intervention, Market Forces and Disruptive Innovation Factors

Global warming brings significant challenges to the global community, potentially altering all aspects of life on the



planet. The UN's plan for reducing greenhouse gas emissions is ambitious and depends on a successful global transition to a low-carbon economy. Carbon emissions emanate mostly from electricity generation, transportation – air, road, and sea – industry, and agriculture. Thus, for this plan to succeed new economies must integrate environmentally friendly technologies into the current energy and transportation sectors. The diffusion rate of new technologies, such as renewable energy sources and reduced transportation pollution, is a central issue. As small improvements

in current technologies are insufficient to meet the UN's ambitious goals, radical and novel technologies are necessary to achieve the desired results. Many scholars examine the various aspects of the energy revolution taking place today, but no theory discusses the complete green energy revolution that started the late 1980s and is expected to be completed in a few decades.

This study addresses market creation and the process of building regulatory infrastructure. Indeed, in those countries which have been pioneers in the field of renewable energy and electronic transportation government support and guidance has created a new and developing market and industry. The goal of the project is to identify what sets apart these countries from those that lag behind. A unique theory was constructed in order to describe the so-called third energy revolution and four case studies were examined using qualitative and quantitative methods, such as interviews, machine learning, artificial intelligence tools, and neuronal and Bayesian networks. In the next academic year the research will analyze the impact of regulation, market factors, and resources of the renewable market by examining no less than 130 countries. This will be done while assessing industry trends, government policies, and customer attitudes.

# SUPPORT SCHOLARSHIPS

## Partners: Mrs. Lili Segal and the “Rakia” Program

Since 2017 BMI has extended support to various scholarships for social leadership and those who have made substantial contributions to their community. The year's annual scholarship ceremony took place on January 11<sup>th</sup> and BMI granted 24 scholarships to M.A. students from disadvantaged groups in Israeli society. The keynote speaker at this impressive event was Professor Aaron Barak, former Chief Justice of the Israeli Supreme Court.



Prof. Aharon Barak, former Chief Justice of the Israeli Supreme Court, Former judge Dr. Avi Zamir and at the scholarship awarding ceremony



# AWARDS AND GRANTS RECEIVED BY BMI FELLOWS

## Two BMI Fellows won the prestigious Dan David scholarship for the second year!



**Karen Umansky**, a BMI Fellow and a Ph.D. student in the department of Public Policy won the prestigious Dan David scholarship in the Defending Democracy category for her study:

**The Rise of New Radical Parties in Contemporary European Politics: Assessing the Impact of New Radical Right Parties' Mobilization Strategy on the Political Sphere.**

*"I'm pleased and honored to receive the Dan David Prize Scholarship. My research on the resurgence of the new radical populist parties is gaining more*

*and more relevance in the context of recent events in Europe. I'm grateful to the Dan David Prize Committee for supporting my nomination and excited to continue researching the behavior of the new radical right in hope that it may help advance ways to respond to this global challenge and safeguard the essential principles of democracy. A very special thanks to my Ph.D. supervisor, Prof. Itai Sened, for encouraging me to always strive for excellence and to the Boris Mints Institute, at which I'm a fellow-researcher, for enabling me to pursue this course".*



**Patricia Akao**, a BMI Fellow and a Ph.D. student at the faculty of Engineering, had won the prestigious Dan David scholarship in the category of Combating Climate Change for her study:

**Microalgae utilization for plasticizers degradation and biofuel production, the circular economy concept.**

*"I am really honoured to be a BMI fellow and I would like to thank you for your generous support towards my Ph.D. studies. The focus of my research is to find simple solutions to provide better water quality for*

*everybody. I am currently at the end of my second year of my Ph.D. in Environmental Studies and by awarding me a scholarship I was able to concentrate on my project and do what I love. I have always been passionate about the environment and the possibility of searching methods to protect it and bring better quality of life for people is a dream come true.*

*This year, due to your support, I won the prestigious Dan David Scholarship in the category of Combating Climate Changing. And I hope to continue pursuing my dream and achieve much more goals in the next years."*

# THE 2019 BMI PRIZE

Starting in 2017, BMI has awards a prize of \$100,000 each May at its annual conference at Tel Aviv University. This prize is awarded to a prominent member of global academia for his or her outstanding work and dedication toward solving a strategic global challenge. The previous recipients of the prize were Professor Jeffry Sachs of Columbia University and Professor Michael Kremer of Harvard University.

The 2019 evaluation committee was made up of three internationally renowned scholars: Professor Anat Admati, George G.C. Parker Professor of Finance and Economics, Graduate School of Business, Stanford University, Professor David Feldman, Chair of the Department of Planning, Policy and Design, School of Social Ecology, University of California, Irvine and Dr. David Benson, Department of Politics, University of Exeter.

## The 2019 BMI Prize was awarded to



Dr. Mints, President of BMI, Professor Joseph Klafter, President of TAU, Professor Itai Sened, Head of BMI and Dr. Peter H. Gleick with the Prize

**Dr. Peter H. Gleick, Co-Founder and President Emeritus, The Pacific Institute for Studies in Development, Environment and Security, for his exceptional work in water research.**

Dr. Gleick is a widely-recognized authority on water issues, having published in a variety of outlets including the leading journals in the field. Moreover, he is a widely-cited on all issues pertinent to the energy-water nexus, water security among, and solutions to problems of water supply. Recognizing that good policy decisions rely on sound science, Dr. Gleick consistently works at the interface of science and policy. He committed to educating the public and is in fact an expert on public education about water issues.

Dr. Gleick has long recognized that as populations and economies grow, the traditional approach to water management is no longer sustainable. Thus, he has defined, described, researched, and advocated for a new way forward-- what he calls the "soft path for water". Dr. Gleick has become a central figure in decisions regarding the creation of a safe and reliable water supply in the face of a growing populations, climate change, and environmental degradation. Dr. Gleick was one of the first academics to understand and address the growing phenomenon of conflicts over water resources at both the subnational and international levels. He has worked on these issues in central America, Israel, Jordan, Palestine, South Africa, and eastern Europe. Dr. Gleick was awarded this year's BMI prize due to his world-renowned

expertise and substantial contribution to facing the global challenge of freshwater – a challenge that is at the heart of the BMI's vision and mission.



Dr. Gleick's lecture at the 4th annual BMI conference is available here:

[https://www.youtube.com/watch?v=2-p-\\_p711Bs](https://www.youtube.com/watch?v=2-p-_p711Bs)



The annual international gatherings of BMI focus on pressing for world policy challenges by inviting a handful of leaders to join a small and carefully selected circle of members of BMI's international board and a small number of outstanding scientists to discuss a particular issue. In these exclusive meetings the global challenges are discussed in-depth and new ideas are encouraged and carefully assessed. The various presentations as well as photos of the events are available on our website: <http://www.bmiglobalsolutions.org/>

## **Blockchain: The New Architecture of the World, Montenegro, 03-05.10.2018**



The excitement around Blockchains and distributed ledger technologies (DLTs) is not without merit. We are witnessing the dawn of what is being referred to as the Fourth Industrial Revolution, as we develop network technologies with the ability to fundamentally change the world around us and our dynamics within it. Most major institutions, from banks to state governments, have recognized the momentum of this new wave and have decided to get on board rather than fight the forces of nature (or networks). As governments, industries, and private individuals make meaningful financial and technical investments in this new revolutionary technological, it is imperative that we understand its potential, its limitations, and our own intentions at this crucial creative juncture. Cryptocurrencies and digital tokens are just the tip of the iceberg. More meaningful opportunities lie under the surface. With this, however, the new era brings new challenges to governance, the protection of intellectual property and human rights. As BMI has pledged to address the major global challenges of our time, it is our duty to place a spotlight on this new and emerging field. The purpose of our 2018 conference in Montenegro was to foster an informed discourse based on expert opinions and the findings of academic, governmental, and industry professionals. The potential and the limitations of Blockchains for addressing pressing global issues of trust, equality, and ownership were all discussed. The goal of the conference was to look past the hype and to dive deep into the technology, its revolutionary potential, and the challenges surrounding implementation and mainstream adoption. Institutions of any kind, and Blockchains is an institutional technology par excellence, are a reflection of the intentions and interests of their designers. The global community has the power and responsibility to maximize the potential of this new technology for the sake of greater equality, global development, and the protection of human rights worldwide. In addition, BMI Board members also meet with Hon. Milo Dukanovic, president of Montenegro.

For a report summarizing the conference:

[https://docs.wixstatic.com/ugd/2ea2a4\\_68349f298eb24fe4a7352a166ac31ce8.pdf](https://docs.wixstatic.com/ugd/2ea2a4_68349f298eb24fe4a7352a166ac31ce8.pdf)

## Research, Innovation and Global Policy, Tel Aviv University, 15-17.5.19



Throughout the past year BMI has focused its attention on extending the international cooperation channels which were established over the three years since its establishment. In addition, the Institute has continued recruiting new Ph.D. students in various fields to work in the five BMI labs, as well as significantly increasing the research span of existing projects. The annual session, held in May 2019, focused on the work of two BMI labs in particular: Conflict Resolution and Water.

In the field of conflict resolution various views regarding the Israeli-Palestinian conflict – its roots, its nature, and the two-state solution—were presented. The topic of water research took center stage and a number of important international projects were discussed. These included the sustainable water program in India carried out by Prof. Hadas Mamane-Steindel, head of the Environmental Engineering Program, Faculty of Engineering, and co-head of the BMI Water Lab, and her team and the work done in Tanzania by the Tel Aviv University branch of Engineers Without Borders, supported by BMI, the TAU Renewable Energy Center and the Institute for Water Research. To conclude the conference, several BMI fellows presented the progress made in their own research projects in the fields of sustainable development, inequality and renewable energy. The valuable lessons learned in this year's conference will help BMI continue its fruitful work throughout the next year.

For a summary the conference see: <http://www.bmiglobalsolutions.org/>

# OTHER BMI ACTIVITIES

## Cooperation with the Eilat-Eilat Renewable Energy Center



RENEWABLE  
ENERGY  
CENTER



## Eilat-Eilat Renewable Energy Bi-Annual International Conference



Professor Itai Sened, head of the Institute, gave a speech at the opening session of the 8<sup>th</sup> Eilat-Eilat Renewable Energy International Conference on behalf of both BMI and Dr. Boris Mints, founder and president of BMI, as BMI was among the sponsors of the conference. This international bi-annual conference took place in Eilat on December 2nd-4th, 2018 and was host to prominent players in the renewable energy and clean-tech industry, both in Israel and worldwide. The conference was very

diverse and covered a wide range of topics, from the leading trends and innovations in renewable energy through to electric vehicles and Blockchain. The BMI delegation was headed by Prof. Sened himself and included researchers from TAU and other universities.

Dr. Ram Fishman, head of BMI Sustainable Development Lab, gave an impressive presentation: "Overcoming Barriers to Technology Adoption in Low Income Populations: the TAU – TATA Trusts Program in India". In it he described one of the most prominent and widely recognized projects BMI has initiated in collaboration with one of the largest philanthropic organizations in India – Tata Trusts.

## Eilat-Eilat Renewable Energy Center 4<sup>th</sup> and 5<sup>th</sup> Arava Seminars on Renewable Energy and Sustainable Development



In our third year of BMI seminars, in cooperation with the Eilat-Eilat Renewable Energy Center, a fourth seminar took place in the Arava on October 7-11<sup>th</sup>, 2018. The seminar was dedicated to discussing inter-disciplinary issues of sustainable development and giving the students hands-on experience in approaching real challenges. The seminar was led by Dr. Ram Fishman, head of the BMI Sustainable Development lab.



The fifth Arava seminar on Renewable Energy Policy took place on February 17<sup>th</sup>-21<sup>st</sup>, 2019. This unique seminar put together public policy, environment and engineering students in order to combine theoretical knowledge and hands-on experience. The seminar was led by Prof. Itai Sened, head of BMI, and hosted Prof. Miranda Schreurs of the Technical University of Munich – one of the world's leading researchers and policy advisers on renewable energy.

Prof. Schreurs of the Technical University of Munich and a member of the BMI Academic Board, giving a lecture at the seminar

## International Courses with the Eilat-Eilat Renewable Energy Center

BMI has created a series of courses for international students in our various fields of activity: renewable energy, sustainable development and water. The courses will be given in English and will grant three academic credits each, are to be held in the Arava valley in Israel. They are part of the continued cooperation between BMI and the Eilat-Eilat Renewable Energy Center. Full syllabi for the courses are available here: <https://www.bmiglobalsolutions.org/single-post/2018/11/06/International-Courses>



## Integrated Assessment Informing Policy: Global, National and Local Analysis Seminar March 13<sup>th</sup>, 2019



In this seminar, given by Dr. Ayelet Davidovitch in collaboration with the International Institute of Applied Systems Analysis, the 'Integrated Assessment Framework' model was introduced. This model is utilized across multiple research programs at International Institute of Applied Systems Analysis. Focus was put particularly on the energy-system model—MESSAGEix-- the macroeconomic model—MACRO-- and their interlinkage with the logit-based mode-choice transport mode, MESSAGE-Transport. Dr. Davidovitch presented several policy-oriented results from country specific MESSAGEix models-- including deforestation effects in Brazil and the potential benefits of shale gas exploitation in South Africa-- before introducing the methodology of the MESSAGEix Israel model and initial results. The full presentation is available here: [https://docs.wixstatic.com/ugd/2ea2a4\\_c1deba38f83a4f918bab9316eef03654.pdf](https://docs.wixstatic.com/ugd/2ea2a4_c1deba38f83a4f918bab9316eef03654.pdf)



## Engineers Without Borders at the Celebration of Tanzanian Unity

On April 30th, 2019, the TAU branch of Engineers Without Borders-TAU, supported by BMI and currently conducting a water purification project in Tanzania, participated in the celebrations of Tanzanian unity—the event that enabled the unification of Tanganyika and the island of Zanzibar. The event was attended by Hon. Job Daudi Job Masima, Tanzania's Ambassador to Israel. It is an example of the growing collaboration between the EWB-TAU team and the Tanzanian embassy in Israel. The goal of the TAU group is to promote the supply of clean drinking water to the villages of Tanzania. The next EWB-TAU delegation to Tanzania is planned for October 2019.



Students with the Tanzanian Ambassador to Israel

## Prof. Itai Sened at Moscow State University

Professor Sened, head of BMI, visited MSU on the 25<sup>th</sup> of September 2018 in order to meet with Prof. Alex Livshin, dean of International Programs at the School of Public Administration. In addition, he gave a lecture and discussed the option of establishing a double degree program between TAU and MSU.



## The 2<sup>nd</sup> Blockchain Israel Hackathon – Blockchain for Social Impact

The Blockchain for Social Impact Hackathon was held this year under the theme “Rewind the future to impact today’s global challenges”. On July 11th and 12th students from TAU, together with engineers, CTOs, data scientists, entrepreneurs, graphic-designers, and CMOs took part in this hackathon. 50 selected participants, 20 teams and 25 mentors took part in this exciting event, working on Blockchain-based solutions to social challenges. As for last year, we focused on leveraging Blockchain solutions for social impact. The winning team – a group of passionate and determined high-school students – developed a Blockchain-based system for the transfer of goods and services between kids and teenagers, called: “Tova” (the Hebrew word for a favor).



The winners of the 2019 Blockchain Hackathon

## Prof. Itai Sened visits *icipe* at Nairobi, Kenya

Professor Sened, head of BMI, visited *icipe* on July 2019, met Dr. Segenet Kelemu, Director General of *icipe*, and visited the institute’s research farm, as the collaboration between BMI gets stronger and recently received additional funding from the Gates Foundation.



Prof. Itai Sened, Head of BMI; Dr. Segenet Kelemu, Director General of ICiPE; Mr. Sunday Ekesi, Director of Research & Partnerships, ICiPE; Mr. Manale Kassie, Head of Social Science Research Division, icipe



Prof. Sened and Ms. Talash Huijbers, Founder and CEO of InsectiPro

# VISITING SCHOLARS

## **Dr. Joshua Ellul, University of Malta,** *Introduction to Blockchain and Smart Contracts – January 29th, 2019*

Dr. Joshua Ellul of the University of Malta visited TAU on January 2019 and gave a lecture on the subjects of Blockchain, DLTs and Smart Contracts, which many are touting it to be the start of the next industrial revolution. With that, people are often still at a loss in understanding what these technologies will mean to them. In this session, Blockchain, DLTs, and Smart Contracts were demystified and a number of use cases for blockchain were introduced.



Dr. Joshua Ellul and head of BMI, Professor Itai Sened

## **Prof. William T. Bianco and Prof. Regina Smyth,** **University of Indiana – Bloomington,** *The Politics of Discontent – East and West – June 4th, 2019*



Polarization is widely seen to have important implications in politics and a large body of literature addresses its causes and consequences. It is, therefore, interesting that there is little consensus about how polarization should actually be measured. While measuring polarization in two party systems is a relatively simple exercise, the same cannot be said about multiparty systems. Prof. Bianco and Smyth address how one should go about measuring polarization by considering how polarization affects political outcomes in different political scenarios (e.g., legislative bargaining and coalition formation). These results provide a foundation for exploring the rise of populist parties in Western democracies and for explaining the variation in the success and survival of these organizations.

Prof. Regina Smyth focused on Russian political institutions. Autocracies seem to be more and more durable as shown by the long-term dominance of Putin and the United Russia party. Despite a large amount of political instabilities and shocks, the government is constantly able to restructure itself and adapt. In terms of the electoral process in Russia, the government has had two options in the past: demolishing the opposition in an election or excluding the opposition in the voting. However, such interference in elections has led to protests. Therefore, Russia switched from excluding the opposition to agenda control. Creation of a hegemonic narrative with Putin himself as the main figure of national pride stopped working in 2011-2012 and protests became commonplace. As a result, Russia began stigmatizing the opposition and splitting it. It will be interesting to see what will happen in the 2024 elections. Putin is getting older, as are many of the representatives of United Russia, and there is an increase in public support for a more liberal agenda.



Prof. Bianco highlighted the many similarities between Trump and Putin, particularly in the process of decision making. Trump is willing to challenge and change established institutions and even uses Twitter to speak directly to the American public. In some areas Trump has succeeded in enacting his agenda, especially in matters where congressional agreement is not needed. Unlike Putin, Trump is not an autocrat, and cannot be one, as there are still many functioning institutions in the U.S. government. Nonetheless, Trump is trying to push a moral panic and his attacks on the media are affecting the public perception of it. It is important to understand that even if Trump's actions cause him to be an unpopular leader, he is still bringing substantial change to the U.S. and the global system.



**Prof. Anat Admati, The George G.C. Parker Professor of Finance and Economics, Stanford University,**  
***Is the Internet broken?* – July 9th and 11th, 2019**

Professor Anat Admati from Stanford University visited TAU and gave two lectures based on a course she recently taught in Stanford's Graduate School of Business. The interdisciplinary course examined the promise, peril, and possible future of the Internet and the impact of the World Wide Web on our lives. It explored the most pressing contemporary issues facing the Internet, including debates over privacy, antitrust, freedom of speech, access, neutrality, and regulation. She also unpacked the claim that "decentralization," promoted by new technologies such as blockchain and crypto assets, capture the original vision of the Internet. The lecture also grappled with a key question: what should be the roles of markets, governments, and stakeholders in shaping the Internet?



## FUTURE ACTIVITIES AND CONFERENCES

1. The next **BMI conference** will be held in **Rome** on September 18<sup>th</sup>-20<sup>th</sup>, 2019, in collaboration with Link Campus University, on the topic: **Conflict Diplomacy in the Digital World**.
2. Introducing the **New Demographic Model of Growth of the Human Population**, with its stabilization between 9 and 11 billion people, as a tool for all the labs that BMI is operating in, as well as a platform for cooperation on a global scale.
3. Initiating international courses in **partnership with the Eilat-Eilat Renewable Energy Center**.
4. Hosting the **2020 Matanel Retreat**.
5. Supporting the lab of a new young researcher at the Faculty of Engineering, **Dr. Gideon Segev**, which will start in October 2019. The support from BMI enabled his return to TAU from a major university in the U.S.
6. Initializing a long-term **collaboration with the International Institute of Applied Systems Analysis** on the topic of the global population.
7. Further **expansion** of BMI's current labs and activities.





**Members of BMI's Advisory Board and Academic Committee:** Russia, Germany, Luxembourg, Armenia, Bulgaria, Czech Republic, Finland, Kenya, Montenegro



**BMI Research:** India, NEPAL, OECD, California, Kenya, Rwanda



**BMI Conferences:** Finland, Malta, Georgia, Armenia, Montenegro



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