A SONG OF EARTH AND PEOPLE

restoring nature to the Hula Valley waterways
and its marginalized communities

The journey of your watershed is right out your window –

among the hills and valleys that surround you...

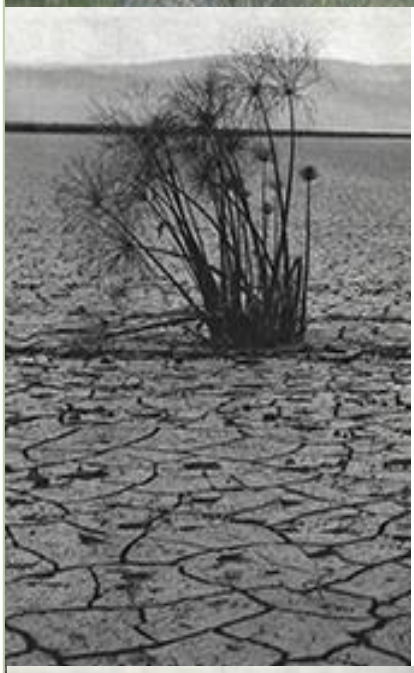
The watershed way is a middle way,

singing a local song,

somewhere close by,

somewhere between mind and planet.

Peter Warshall (1940 – 2013), *The Whole Earth Catalogue*



"The Song of a Dying Lake" - past and future

LAKE KINNERET AUTHORITY

Yad Hanadiv יד הנדיב يادِ هَنَديف

LYG Environmental Projects LTD

A SONG OF EARTH AND PEOPLE: restoring nature to the Hula Valley waterways and its marginalized communities

The beauty of the Hula Valley lies in its natural features and water landscapes. Together they constitute a unique ecosystem of national and world importance. Rehabilitation of the Jordan River system in the Hula Basin is an opportunity to renew the covenant between humans and nature and, through it, to deepen the covenant between fellow human beings.

Team leader

Eng. Ran Molcho	Lygm Environmental Projects

Written by

Dr. Ar. Daphna Drori	Lygm Environmental Projects
Prof. Ayelet Shavit	Tel-Hai College

Co-writers

Natalie Zeevi	Kinneret Drainage and Streams Authority
Carmel Dudley	Lygm Environmental Projects
Dr. Didi Kaplan	Ecology

Plan, Maps, Illustrations and Graphics

LA. Yochai Koren	Lygm Environmental Projects
LA. Ilit Hollander	Lygm Environmental Projects
Yasmin Kayouf	Lygm Environmental Projects

Background. The pastoral Hula Valley on Israel's northern border is recognized as both a biodiversity hotspot and a peripheral area where mistakes of the past still shape present challenges. Fifty-five years ago, under the ethos of the "melting-pot" and "conquering the land," the Hula Lake and the Jordan River underwent dramatic drying out and channelization, both ecologically and socially. The proposed project is an opportunity for *tikkun* – repair.

Bounded by the steppes of the Golan Heights and the Naftali Mountain Ridge, the valley is a patchwork quilt of agricultural areas, natural and artificial bodies of water, and Jewish and Arab rural and urban settlements. This land of "streams of water" (Ps. 1:3) is the drainage basin of a rich aquatic system flowing into the Jordan River and from there into the Sea of Galilee.

Before its draining, the Hula Valley was flooded marshland with a lake and what were known as the Hula swamps. The valley's dramatic story is bound up in the Zionist one: in the late 19th century the valley was notorious for the malaria mosquito that claimed many victims among residents of Yesod HaMa'ala, and was seen by Jewish settlers as a threatening place. Not so, however, for its Bedouin residents - for the Al-Ghawarna tribe that sustained itself from fishing, mat-making, and raising water buffalo and for the neighboring tribe of El-Heib the valley was home.

When the state of Israel was established, the Hula drainage project was conceived with the aid of Jewish National Fund as a way to prepare land for agriculture and as a flagship Zionist project. To complete the effort, the valley's streams and the Upper Jordan River were routed into engineered canals at the margins of agricultural areas.

At the time no controversy accompanied the "Hula Operation," and there was no public protest over evacuating the Al-Ghawarna tribe from the lakeside or reducing the El-Heib territory (despite their volunteering in the Israeli military forces); however, not everyone supported the drainage. There were those who warned against disappearance of a unique natural landscape, arguing that it should be preserved for coming generations. Peter Merom wrote in *The Song of a Dying Lake*: "In the end the expected happened. Even so, it came as surprising, gripping, terrifying – like the death of a loved one after a long illness. The steel monster breached and decreed its judgment from deep within the lake... The backhoe dug and lacerated, tore and cut and amputated without mercy, according to the line drawn and according to the cold and calculated plan."

Against this backdrop, Israel's first nature reserve was established in 1964: the Hula Nature Reserve. Compared to other sites drained worldwide, this was an environmental achievement; however, its area is comparatively small.

The 1990s project to rehabilitate the peat lands signaled the beginning of a change in attitude toward the valley and the ecological damage it sustained. Some of the swampland was

reflooded, the Agamon HaHula (the “Little Hula Lake”) was created, and a high water table began to be maintained by a system of agricultural canals.

The proposed project aims for a deeper, more just restoration of the Hula Valley: affirmative action for valley communities alongside continued ecological rehabilitation. The project aims to affect the entire valley, with a focus on development towns (Hatzor HaGlilit and Kiryat Shmona) and minority villages (Tuba-Zangarriye and Ghajar) that did not gain land or water from the drying of the lake, whose local heritage is typically marginalized and whose ties to nearby natural springs have often been cut.

The guiding principle in choosing the Hula Valley is the potential for combined environmental and human benefit from rehabilitation of the Jordan River canals and reflooding of the Hula Lake. Participation of the diverse communities in all stages of the process, from planning to implementation through long-term maintenance, will create a platform for collective partnership in managing the valley’s treasures – a significant step toward creating shared space and one in which all can develop a sense of place.

The communities of the Hula Valley are a mosaic of Israeli society – ultra-Orthodox, Orthodox, and traditional communities in the development town of Hatzor HaGlilit live alongside secular communities in Rosh Pina; secular and traditional communities share space in the towns of Yesod HaMa’ala and Metula; moshavim and kibbutzim of the regional councils Mevo’ot Hermon and Upper Galilee live alongside the urban residents of Kiryat Shmona; and the Arab communities include the Bedouin of Tuba-Zangariyye and the Alawite in Ghajar. Today, spheres of joint activity are rare and conflicts between socio-economically weaker and stronger communities are common. In response to this reality, the project proposes a comprehensive educational and academic effort designed to connect all communities to the heart of the initiative, including marginalized communities.

The Hula Valley contains the highest terrestrial biodiversity in Israel, but large numbers of visitors burden its sensitive ecological systems. Development of new recreational areas and promenades will assist in dispersing the crowds. In addition, climate change has reduced average rainfall and raised drought risk on the one hand, and brought about events of extreme rainfall on the other. Flood events affecting wildlife, farmers, and residents heighten the need to strengthen the economic resilience of communities in the valley. Integrative management of the Upper Jordan River basin – aimed at efficient, multipurpose use of the Jordan River and its sources that attends to local and national needs – will enable the basin to provide a spectrum of ecosystem services: natural, clean flow downstream; conservation of ecological systems; recreational water tourism; agriculture; and cultural and educational connections throughout the valley.

A central issue of the proposed initiative is coping with the diverse interests and needs of diverse stakeholders, while recognizing the inherent opportunities of a beneficial, sustainable interface that integrates communities, nature, agriculture, and ecotourism.

The social challenge: To empower marginalized communities living on Israel's northern firing line through use of community capital for planning and developing new social, educational, and business initiatives aligned with the project's goals.

The ecological-environmental challenge: To sustain the valley's unique and fragile ecosystem by addressing degraded aquatic habitats; inadequate ecological corridors; reduced flow of natural spring water into the basin; restoring the Hula Lake at its historic site; shelter scarcity for the 500 million birds migrating annually between Europe and Africa; and extensive flooding in the basin.

The agricultural challenge: Fulfilling the potential of water for crop irrigation while reducing peat erosion.

The tourism-employment challenge: Easing visitor pressure on the Jordan River's ecological sensitive northern headwaters by adding recreational sites and developing ecotourism initiatives.

The management challenge: Creating an administrative body that will be an effective platform for regional collaboration. Challenges include uniting public bodies currently operating separately; generating active participation of all communities in the Hula Valley in a thinktank mechanism; and developing an implementation and enforcement mechanism for effective development, preservation, and maintenance of the space.

Vision – to establish an interface of integrated benefits in the Hula Valley between nature – community – agriculture - tourism that is mutually beneficial and sustainable in the long term. The landscapes of the valley's springs, rivulets, streams, and lake will become a life-giving resource for the plants, animals and human communities surrounding them. Joint educational, cultural and community-science activity around the issue of water, and opening the streams and

lakeshores to all, will encourage communities with fewer economic resources to reclaim their local heritage and access to water recreation – renewing the covenant between humans and nature and, through it, to deepen the covenant between fellow human beings.

The project suggests a holistic integrative management model for shared living in a valuable open space on national and international scales. The model emphasizes the overall needs of the natural systems and services they provide to human communities: various "tribes" within Israeli society, farmers, tourism operators, and individuals with special needs. Most important, the model will incorporate the community into all stages of planning and implementation, including supporting community and educational projects, academic research, and establishment of long-term community pro-active platforms. The current scenery of the Hula Valley was shaped by a “melting-pot” ideal in a top-down fashion – now is the time for a multicultural, bottom-up vision of the future.

The proposed project integrates and strengthens diverse initiatives of the Hula Valley Basin, some of them already funded by the project's committed partners: the Eastern Galilee Cluster, the Nature and Parks Authority, Jewish National Fund, government ministries, the Water Authority and more.

The eco-hydrological project is the restoration of the Hula Lake at the confluence of the Jordan River canals, creating ecological and economical touristic value and as an overflow reservoir for flood regulation. At the confluence of the eastern and western canals, a lake spanning over 2,500 dunams will be created on the site of the former lake by releasing water currently being pumped from natural springs on the slopes of the Golan Heights. It will be a platform for ecological rehabilitation of a lake habitat with water at changing depths of up to 2.5 meters - depths currently lacking in the Hula and the Agamon. The lake will also be a recreational area for swimming and boating.

The eastern and western Jordan River canals are engineered canals, 30 kilometers in total length, beginning at the meeting of the sources of the Jordan (Hazbani, Dan, and Banias streams). They join to form the stream channel of the Jordan, flowing south out of the Hula Valley through a deep canyon that spills into the Sea of Galilee. The canal morphology will be altered from straight to structurally complex, creating rocky meandering streams with diverse ecological niches. The

space will be transformed into a scenic stream landscape, a recreation site with promenades and facilities integrated with sensitivity into the natural surroundings.

A socio-economic model of collaboration will be used to implement the initiative. Each community will adopt a section of stream and become involved in planning, execution, and supervision of project areas, fostering connection to the natural space being created. Moreover, the size and location of sections will be allotted by affirmative action, with the goal of reducing the sense of injustice present among residents of communities currently lacking access to the Jordan. Choice of community projects for each stream section and at each project stage will be made according to the needs and worldview of each community. Community ambassadors will be hired to manage community projects, and the communities will be invited to participate in the Hula Valley Community Forum for Planning. This model of participating in significant processes in one's living environment is adaptable to community preferences and hence can be exported as a model to a variety of settings.

Collaboration with academia - Tel-Hai College, MIGAL (Galilee Research Institute), and Northern Research and Development - in the fields of natural and social sciences and the humanities will be fostered by creation of a *Citizen Science Model* under the leadership of Tel-Hai College. The model will include academic courses, research groups in collaboration with the community, Town Square Academy courses, and research and evaluation of the entire project.

Collaboration with the Botanical Center for support and protection of rare and endangered plant species in the Hula Valley. The center will unite several complementary initiatives under one roof for community educational activity:

- Nursery and sanctuary for preservation of rare plant species and for propagation of native plants and their return to nature.
- Community education center: residents, school, pre-army academy and college students, returning soldiers, prisoners, and elders will be integrated into regular operation of the botanical center.
- Integration of special needs populations in the nursery and plant sanctuary.

Establishment of an Interactive Museum of Bedouin Heritage: In addition to the plants and animals that became extinct with the drying of the Hula Valley, traditional lifeways that connected humans to their environmental surroundings were lost. A museum conferring public

recognition to Bedouin heritage will be established in Tuba-Zangarriye, with a promenade connecting it to a satellite museum station of Bedouin crafts at the lakeshore.

Expanding community education on streams and springs at the Hula Valley margins. The "Guardian of the Stream" program currently operating in 24 area elementary schools and 11 high schools will be expanded to include groups of activists from Hula Valley communities.

The collective benefits of such an enrichment of diverse ecological and social habitats will be far and above its contribution to each separate community:

The project will establish hydrobiological connectivity between the Agamon, Hula Nature Reserve, valley canals and their confluence, and the Jordan River system, increasing their ecological value a hundredfold, in addition to strengthening the ecological connection between the Galilee and the Golan Heights.

The project offers social and educational benefits for diverse peripheral populations. Initially, each community will connect to the section of stream or lakeside for which it is responsible. Subsequently, the communities will be connected to one another through regional events and collaborative science and educational projects, which will also provide additional sources of income. The physical investment in the space is a practical step in supporting the declining agricultural sector in general, and in strengthening its resilience in the face of extreme weather conditions. In addition, restoration of bodies of water will generate business initiatives and employment for diverse non-agricultural communities. Branding the entire valley (and not only the Hazbani, Dan, and Banias reserves) as recreational space will help everyone, from Kiryat Shmona to Tuba-Zangarriye, benefit from increased tourism throughout the year.

The project will enhance the area's natural beauty and serve as catalyst for communal activism and contribution to a national project. We believe that students and volunteers of all ages from Israel and abroad will take part in restoring balance to the human-nature relationship: working in the botanical center, ringing birds at the Agamon HaHula, cleaning the streams, learning about local history, making traditional Bedouin crafts, and becoming agents of change in their own communities.

The initiative suggests an **innovative approach** for managing a multi-purpose hydrologic-communal project, flexible in its applications and influencing diverse target populations and scales: from the community, to the region, to the nation and beyond. This project is GLOCAL (global + local) in its essence.

The project is multi-purpose, providing solutions to dilemmas of nature, hydrology, drainage, agriculture, tourism, education, heritage, academia, and community. It does so through comprehensive treatment of the complex interface between them, and between the communities, non-profit organizations, and researchers involved in the same issues.

The project develops an integrative management model of different public bodies collected under one roof. The area being managed is a large open space, characterized as a diverse and valuable ecological cell. The planning and implementation processes will be just, bottom-up and sustainable in the long term, harnessing diverse communities that together will achieve environmental and social restoration in the Hula Valley - for themselves, and for the entire state of Israel.

The suggested model for **sustainable management of the space** includes organizations operating in the field with the experience and proven capability in rehabilitating and managing valuable open spaces, in education, in research and in leadership:

Management**:** The "Streams and Open Space Administration," including the Upper Galilee and Mevo'ot Hermon regional councils, is a multi-participant body operating since 2005. It will be responsible for determining the character of existing activity in the streams.

Implementation**:** The Kinneret Drainage and Streams Authority, with vast experience in rehabilitating and regulating water systems in the Jordan Basin, will be responsible for implementation. The authority has proven its ability to connect between physical rehabilitation and community and education. In 2008, it led passage of an amendment to the "Kinneret Beaches Law" (Sea of Galilee) creating and regulating quiet, green beaches with an emphasis on public access. The authority has an annual budget of 100 million and is experienced in managing projects of the proposed size.

Community involvement**:** Community collaboration will be coordinated by the community department of the Kinneret Drainage and Streams Authority together with the Eastern Galilee Cluster, a regional body of Upper Galilee and Golan municipal authorities for advancing a regional perspective and strategic cooperation, as well as the Hula Valley Community Forum for Planning that will be established. The Upper Galilee Regional Council has proven experience in overseeing activity at the sources of the Jordan and in advancing projects for rehabilitating sites

along the streams. Its environmental department established “Guardians of the Stream,” with thousands of volunteer students and residents participating in educational and field activities.

Additional organizations operating in the space:

Jewish National Fund (JNF) is a national public body managing large open spaces with the organizational capacity to implement large scale projects. JNF is deeply connected to the Hula Lake, from its drainage to today; it maintains large areas of the Hula lands rehabilitation project and is responsible for tourism and management of open space in the heart of the Hula Valley.

Israel Nature and Parks Authority (INPA) is a government body with management and enforcement authority, entrusted with preserving Israel’s natural assets. The INPA has rich experience in natural resource management, rehabilitation, and providing visitor services at the Hula Nature Reserve.

Tel-Hai College has expertise, knowledge, and experience in community-academia partnership. Every year, since 2011, hundreds of residents and tens of researchers volunteer in the framework of the Academy in the Square, and the organization has gained experience in citizen science, social-environmental activism, knowledge documentation, and local heritage.

Kinneret Innovation Center for Agritech Initiatives, Kinneret College, is grounded in the interface between academia and industry. Companies and organizations with vast knowledge operate in the center, which integrates human resources and academic knowledge to assist companies in becoming greenhouses for innovation. Some of the tourism initiatives in the Hula Valley are assisted by apps and other tech initiatives, and Kinneret College’s experience in this field has been recognized.

The Society for the Protection of Nature in Israel (SPNI) is a non-profit environmental organization that focuses on protecting and preserving Israel's natural resources, environment, natural assets and unique landscape.

Budget assessment

General Description	Assessment NIS (million)
Community	
Guardians of the Stream – expansion of community education program	11.0
Community activist and volunteer groups coordinated by paid community ambassadors	7.5
Town Square Academy and Citizen Science programs	6.0
Establishment of botanical center and therapeutic rehabilitation center	5.0
Bedouin Heritage Museum (active) in Tuba-Zangarriye	1.5
Mentoring farmers	1.25
Mentoring tourism entrepreneurs	0.75
Quarterly regional events	2.0
Activities for special needs populations	3.0
Total Community	**38.0**
Nature	
Aqua-hydrologic restoration of Jordan River canals to complex stream structure	80.0
Creation of stream habitats in the valley canals that flow into the Jordan River	5.0
Rehabilitation of springs on the margins and removal of water pumping infrastructure	4.0
Vegetation and habitat maintenance	5.0
Total Nature	**94.0**
Tourism and Business and Employment Initiatives	
Tourism infrastructure development at Jordan canals and water bodies	30.0
Multidisciplinary database and supporting applications for data entry	1.0
Regional and national branding and marketing	5.0

Development infrastructure maintenance	5.0
Total Tourism	**42.0**

Agriculture (External funding)

Infrastructure for bringing water to agricultural fields	80.0
Constructing multipurpose water bodies in the area of the canal junction	200.0
Removal of water pumping infrastructure from streams including site restoration	2.0
Total Agriculture	**282.0**
TOTAL	**456.0**

The Team

Ran Molho, Eng. - LYGM Environmental Projects

Ran earned his B.Sc. and M.Eng. in soil and water engineering at the Israel Institute of Technology (Technion) in Haifa. He worked for many years at the Erosion Research Station in the Ministry of Agriculture and Rural Development, and as the lead engineer for Kinneret Drainage and Streams Authority. Ran founded LYGM Environmental Projects in 2009 - today a firm of 35 planners and experts. Ran's work both as an engineer for the Kinneret Authority and as a private consultant in the field of streams and river rehabilitation was in many ways ground-breaking in Israel, paving the way for others to adopt his integrative, holistic approach.

LYGM Environmental Projects

LYGM Environmental Projects is a multidisciplinary consulting and planning firm combining the fields of hydrology and drainage engineering, landscape architecture, ecology, agriculture, urban and open space planning and planning management.

LYGM's work focuses on planning and execution of integrated interdisciplinary projects

- Ecohydrology
- Drainage engineering
- Landscape architecture
- Sustainable agriculture and soil conservation
- Regional open space planning
- Wetland and aquatic habitat restoration
- Rehabilitation of environmental and aesthetic damage to natural areas
- Urban runoff planning

The LYGM team includes drainage and soil conservation experts, hydrological engineers, architects, landscape architects, environmental engineers, urban planners, ecologists, designers, surveyors, GIS specialists, and project managers.

The firm's experience spans all planning scales and types, from local, small-scale practical planning, to the whole council, municipality, basin or multi-basin scale. One of the firm's recent works was a policy paper for the Ministry of Agriculture and Rural Development, addressing the issue of riparian buffer zones in agricultural areas in Israel and tools for implementing them in cooperation with landowners and other stakeholders.

Lygm has led eight master plans for regional councils in the north of Israel, basin scale stream masterplans (e.g. Dishon Streem, HaShofet Stream), multi-basin scale conservation masterplans

(e.g. vernal ponds in Shikma, Bsor, Sorek and Lachish basins), large-scale river rehabilitation plans (e.g. Jordan River, Hadera River, Gdora Strean, Zippori Stream) - and many more.

Importantly, LYGM has extensive experience in working with all types of public bodies, balancing the varied needs of different stakeholders and working with the communities involved.

Didi Kaplan, Ph.D.

Didi is an ecologist with 40 years of experience in the Israeli Nature and Parks Authority in planning and implementation of biological management of nature reserves and wetlands; preparation of management plans and ecological surveys; designing planning methodology for nature reserves; and assessing the impact of infrastructure on nature. He is also an expert in the design and monitoring of grazing systems, in post-fire management of natural areas and in fire damage assessment. Didi participated as a team member in the EU's working task force of post-fire management, is a lecturer at international conferences and a member of the International Association of Landscape Ecology. He is also an agronomist and an expert in tree surveying and risk assessment. He was nominated as an Adjunct Senior Teaching Associate (Adjunct Associated Professor) at the Israel Institute of Technology (The Technion) in Haifa and at the Tel Hai College Department of Environmental Sciences in the Upper Galilee.

Prof. Ayelet Shavit, Ph.D. Tel Hai College

Ayelet is a philosopher of biology and the 2018 winner of the Higher Education Prize for a young faculty member, awarded by the Israeli Council for Higher Education. She is a faculty member in the Faculty of Sciences and the Faculty of Social Sciences and Humanities at Tel Hai College and raises three young boys in the beautiful Upper Galilee. Combining all the above, Ayelet co-founded “Town-Square Academia": a pro-active academia-community partnership, which teams local and academic experts to volunteer together, teach free courses in underprivileged communities and produce relevant knowledge to both.

Project Team

Oshry Yaloz	Kinneret Drainage and Streams Authority	Engineering Department
Yael Sela	Kinneret Drainage and Streams Authority	Education, Community and Publicity Department
Natalie Zeevi	Kinneret Drainage and Streams Authority	Education, Community and Publicity Department
Miriam Ben Shalom	Lygm Environmental Projects	Planning management

LA. Yochai Koren	Lygm Environmental Projects	Landscape architecture
LA. Ilit Hollander	Lygm Environmental Projects	Landscape architecture
Ron Raymond	Lygm Environmental Projects	City and regional planning
Dr. Hadas Reiser	Lygm Environmental Projects	Hydrology
Adi Levy Eisenberg	Lygm Environmental Projects	Hydrology
Or Shaltieli	Israel Water Authority	Planning engineer
Dr. Didi Kaplan	Consultant	Ecology
Dr. Ayala Cohen	Tel-Hai College	Social work policy
Dr. Maya Duani	Tel-Hai College	Environmental history
Tovy Alfandri	Consultant	Public engagement
Eng. Eli Sabag	Hermon Engineers	Accessibility
Anat Nissim	SPNI	Public organizations
Huda Nadeem Eid	Ghajar	Social psychology
Nawal el Heib	Tuba-Zangarriye	Women and gender
Anat Shapira	Kibbutz Sde Nechemia	Public representative
Prof. Noga Collins-Kreiner	University of Haifa	Tourism and Leisure

Scientific Board

Prof. Ayelet Shavit	Tel-Hai College	Community Science
Dr. Yoni Vortman	Tel-Hai College	Coypu ecology
Dr. Jan Mark Dufor Dror	Tel-Hai College	Invasive species
Prof. Iggy Litaor	Tel-Hai College	Water and soil
Prof. Nir Becker	Tel-Hai College	Environmental economy
Prof. Doron Lavi	Tel-Hai College	Environmental economy
Prof. Daniel Orenstein	Technion	Architecture andTown Planning
Prof. Aaron M. Ellison	Harvard University	Ecology and Evolutionary Biology
Prof. Sabina Lionelli	University of Exeter	Database

Directorate

Giora Saltz	Upper Galilee Regional Council	Head of Council
Eng. Ohad Livnat	Upper Galilee Regional Council	Council Engineer
	Streams and Open Space Administration	Chairman
Benny Ben Muvchar	Mevo'ot HaHermon Regional Council	Head of Council
Tzvika Slutsky	Kinneret Drainage and Streams Authority	CEO
Zeev Achipaz	Israel Water Authority	Operatoins Department Manager and acting CEO
Nissim Keshet	Israel Nature and Parks Authority	Head of Environment Division
Guy Ayalon	Israel Nature and Parks Authority	Head of North District
Nurit Tzur	CEO	Eastern Galilee Authorities Cluster
Ram Shadmon	Israel Ministry of Agriculture and Rural Development	Soil conservation
Ofer Barnea	The Agricultural Society of the Upper Galilee	CEO
Erez Weissman	Galilee water association	COE
Dror Pevsner	Israel Ministry of Environmental Protection	River Restoration and "Guardians of the stream" National Program
Orly Tsarum	Government Tourism Administration	Head of project and contracts field
Dana Tabechnik	SPNI	Public organizations
Elad Shamir	Kinneret Innovation Center for Agritech Initiatives, Kinneret College	Manager