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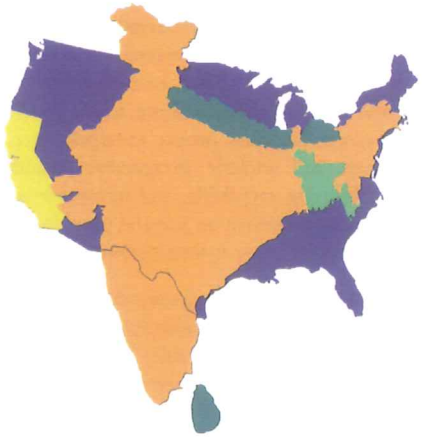

The International Institute
of the Bengal and Himalayan Basins

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PEACE

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The International Institute of Bengal and Himalayan Basins (IIBHB) is a nonprofit organization headquartered in Berkeley, California, and registered in the United States and India. We work on environmental and ecological issues in California, the Bengal and Himalayan Basins, and in other locations around the world. The IIBHB also supports educational, health, housing, women's and human rights in the Bengal Basin as well as in other areas where its services are needed.

Contact — Director@IIBHB.ORG — 510-575-5112

The HydroGramin Model: Water that Works for Everybody

A New Kind of Community. A HydroGramin is a watershed management community which serves to provide the benefits of clean water, housing, nourishment, education, access to health care, a decent wage, and membership in a supportive community in exchange for a willingness to work within the HydroGramin community or on the common land. Membership is free for the poor; the only repayment expected is that members flourish.

An Investment in Better Lives. The HydroGramin is an investment in better lives. We believe that the possibilities of fairness begin with opportunity, and that the best mechanism for social and economic growth is providing the poor with the means of self-improvement. If our development practices continue to destroy the lives and livelihoods of our less fortunate citizens under failed promises of prosperity, economies will not thrive and democracies will not survive. We believe that, within a proper framework, the provision of land and education, combined with the transfer of technical knowledge and wherewithal, will have large payoffs for local economies. But more importantly, these benefits will emerge from the increased health and happiness of the population.

Water Knows no Boundaries. When we seek to impose them financially, through privatization, we limit our own humanity. Water is life, it is the fundamental truth of the human body, and we must not allow our financial institutions to monetize water's equity against the lives and livelihoods of the poor. Development practices should promote the financial wellbeing of the community, and, like the medical profession, they should do no harm. We think of the HydroGramin as a new form of ecological community. For those without financial resources, membership in a HydroGramin cooperative begins with an interest free loan. The cooperative seeks no profits for itself, but returns its gains to the community and distributes them among the people. In exchange for sweat equity, the HydroGramin returns to its members both human equity and equity in the form of food, a wage, a home, and services including healthcare, education, and village maintenance. The loans made by HydroGramins are opportunities for better lives, and in return for these loans, HydroGramins expect that their members will take such opportunities and make them work for themselves, their families, community, and nation, and for the overall benefit of a planet beset by a water crisis unprecedented in human history.

A Water Bank. We must thin globally and act locally, yet acting locally can have global consequences. Like seeds, water is a precious resource that requires new models for conservation, and HydroGramins are water banks that follow the model of seed banks. As with the seeds upon which human life ultimately depends, water must be counted among our most precious resources, a necessity of life which must be possessed in common, and a form of sustenance that must be shared before it can be sold or traded. The HydroGramin is a water bank that allows us to recharge depleted aquifers and conserve this resource for the future. In this model, participants invest their efforts in the care and preservation of our water resources, and, in exchange, receive better lives and livelihoods. In return for the opportunity to work on the land and in the villages, economies will grow from the ground up. We can do more to achieve social and economic goals when we regard the basic requisites of human equity as investments in human and ecological capital.

HydroGramin Construction Protocols

- HydroGramin sites will be built to superfund standards, or, where not applicable, to local standards or better.
- CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) and RCRA (Resource Conservation and Recovery Act) Standards will be applied where applicable.
- Risk Assessment.
- EPA site cleanup process will be followed for all sites. Mitre model will be used for ranking.
- Point and nonpoint sources will be evaluated during the selection of HydroGramin sites.
- Environmental setting will largely depend on water yielding areas.

About the IIBHB

The IIBHB was cofounded by Dr. Rash B. Ghosh, a Bengali-American scientist, Glenn T. Seaborg, the 1951 Nobel Laureate in Chemistry and discoverer of Plutonium, and Charles H. Townes, the inventor of laser technology, the 1964 Nobel Laureate in Physics, and the 1999 and 2005 recipient of the Tagore and Templeton awards.

The IIBHB has attracted a wide range of experts in many fields who are ready to assist in the search for solutions to the various water problems that exist throughout the Bengal and Himalayan Basins and the rest of the world. Among the prominent scientists and scholars currently associated with the IIBHB is Douglas Osheroff, the 1996 Nobel Laureate in Physics, and our cofounder, Professor Townes. The IIBHB has local chapters in England, Bangladesh, and India.

Our mission is to operate globally using our experience in South Asia and California to create working models that address the water crises in emerging economies. The Himalayan and Bengal Basins and their vast catchment areas are home to one of our planet's most important fresh water resources. This region includes vastly different hydrologies, geologies, and ecosystems, and it spans elevations ranging from the world's highest peaks to one of the lowest lands on earth. The extreme differences in elevation, geography, and ecology make this region exceptionally valuable for developing water management and remediation technologies for the rest of the planet.

The IIBHB offers pro bono environmental consulting services to industries, landowners, and citizens in the US, on the Indo-Bangla Subcontinent, and elsewhere. Two-hour sessions are available with additional hours for those working for the benefit of the community, including nonprofit and political organizations. Confidentiality is assured. Expert advice is available from the faculty of some of the best universities in the United States, Europe, and the Indo-Bangla Subcontinent. Contact director@iibhb.org.

The HydroGramin

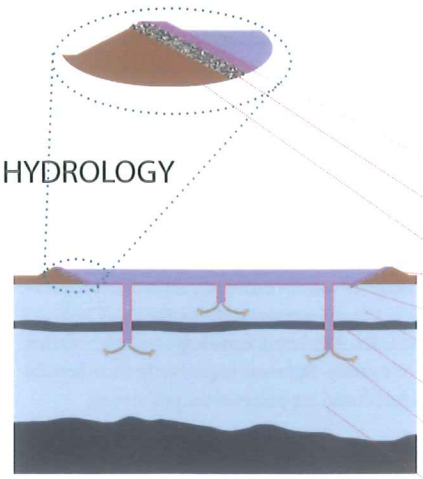
• ***The Global Water Crisis.*** Over the next hundred years, sources of water fit for human consumption, including surface waters, shallow and deep aquifers, and glaciers will face increasing threats of depletion and contamination as a result of climate change, deforestation, desertification, population growth, sea-level rise, and unwise industrial, agricultural, and development practices. In fact, what we call the "water crisis" is a particular way of looking at a larger systematic and comprehensive environmental crisis now manifest across our planet in the forms just enumerated. Ideally, solutions to any of these problems should be multifaceted, aimed at remedies that tackle a number of our Earth's most urgent problems holistically. Providing environmentally friendly housing, agriculture, and water resources for an increasing population while teaching sustainability. Given the magnitude of the complex and burgeoning crises, comprehensive solutions are an investment in our future and the health and continuity of our ecosystem. Remedies are necessary. Our contribution is what we call the "HydroGramin" model, a design for a complex of villages built around a central reservoir on the principles of sustainable hydrological, architectural, and agricultural development, which addresses the challenges of sea-level rise. While serving its communities economically and as a source of clean drinking water, irrigation, and aquaculture, HydroGramin projects will, in turn, be used to recharge or cleanse deep and shallow aquifers and will also prevent land subsidence.

• ***The HydroGramin.*** The term "HydroGramin" is a combination of the Greek prefix, "*hydro*," which means "water" and "*gram*," the Bengali word for village. A HydroGramin is a watershed management cooperative consisting of a complex of villages built around a reservoir, which has been constructed to recharge aquifers, to mitigate toxic pollution, and to provide sustainable, self-financing, and economically independent homes and communities for the poor and for those who are willing to contribute expertise or otherwise willing to support the cooperative.

• **Reservoirs.** Reservoirs (max 3 sq. mi.) will be built within 26.5 degree embankment dams covered with stones, and sealed with sheeting made from a durable, inert, impervious material such as Tyvek, which will protect the reservoir from contaminants in the local soils and shallow aquifers. The reservoir will be fed by rivers and rains, and injection tubes will permit rapid percolation for efficient recharging and cleansing of depleted and contaminated shallow and production aquifers. Hydrologically sensitive areas surrounding the HydroGramin will be left undeveloped to protect aquifers and support percolation. Existing water bodies can also be adapted serve as reservoirs. One requirement for construction of a HydroGramin project is that it be sited on land that is secure for 100 years against flooding and sea-level rise. Construction of Hydrogramins in coastal regions will also include the planting of mangrove forests around cooperatives to prevent soil erosion.

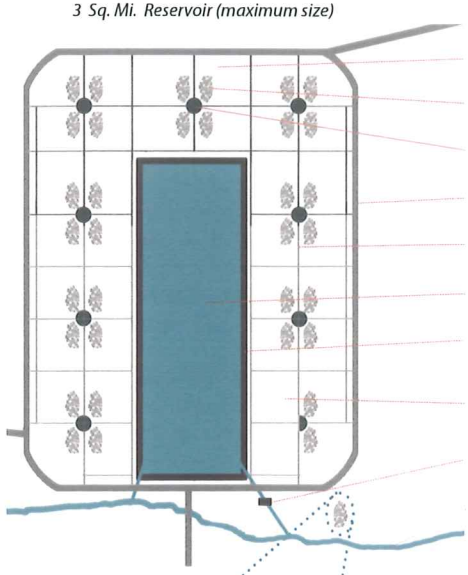
Writing, Layout, and Graphic Design by John Paulin, PhD. *2015/04/09*

Dam Cross Section

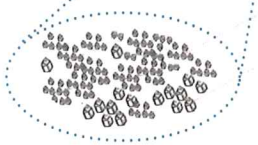


HYDROGRAMIN COOPERATIVE

3 Sq. Mi. Reservoir (maximum size)



STARTER VILLAGE



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• **The Starter Village.** The HydroGramin Complex will begin with a starter village that will serve as a model for the development of additional villages around the reservoir.

• **Villages.** A complex of sustainable, environmentally sound villages removed at least 100 meters from the reservoir and surrounded by communal areas for public facilities, including schools, houses of worship, communal and family agriculture, administrative buildings, playing fields, sports facilities, private enterprise, etc. Preferred building materials will include inexpensive, readily available, environmentally friendly, recyclable, and renewable resources. For example, bamboo can be grown on site and provides the additional benefit of carbon sequestration against climate change.

• **Subsidized housing** will accommodate the poor and the landless. However, an additional preference exists for civil and environmental engineers, teachers, medical, community health, and human rights professionals and others willing to work within the cooperative.

• **Unsubsidized housing** pays for village and reservoir maintenance, community facilities, fisheries, agricultural assistance for villagers. No more than 2 units of unsubsidized housing may be purchased per family within any given HydroGramin Cooperative Complex. Unsubsidized housing residents will have the same rights, responsibilities, and membership obligations as other cooperative residents. 20% of profit from property sales will be invested in technical training of villagers. First priority will be the children of the poor, who will receive a solid educational background that will either prepare them for higher education or, vocationally, for specialized trades within the cooperative.

• **Communal Areas.** The *village centers* will contain facilities for civic and communal activities to be shared among four adjacent villages. Schools, administrative buildings, clinics and hospitals will be situated here, as well as private enterprises through leasing and rental agreements. The *commons* situated outside the villages are for playing fields, light recreational use, and family and cooperative agricultural ventures. The commons may contain communal cow sheds and other shared facilities.

• **Economy**. The reservoir itself will contribute to the local economy by providing water for irrigation and fisheries. Among the economic benefits that the HydroGramin will offer to underdeveloped areas is the introduction of a service economy, which will offer stability against the seasonal fluctuations and other vulnerabilities of a solely agricultural economy. Additionally, real estate values in the vicinity of the reservoirs can be expected to rise and will create a demand for unsubsidized housing as the land becomes more developed. The HydroGramin administration will promote the community economy by encouraging the development of cooperative and private, entrepreneurial enterprises within the communal areas. All residents of the HydroGramin will have access to the resources of the communal areas which will include plots for individual and cooperative farming and commons for grazing livestock.

• **Public Education.** A commitment to accepting free public education of all children, girls as well as boys, is a requirement for joining the cooperative.