

Restoring Water Sources to Increase Access



Field monitoring on the construction of infiltration ponds conducted by USAID IUWASH and CCFI in Ketindan Village, Lawang Sub-District of Malang District.

A key goal of the USAID Indonesia Urban Water, Sanitation and Hygiene (IUWASH) project is to increase access to safe water for 2 million people, especially the urban poor. However, detailed assessment exercises conducted by the project reveal that in up to 40 percent of the target municipalities, efforts are being seriously hampered by the declining availability of “raw water” from the springs and wells on which many local water utilities rely. Many other regions have also identified this as an emerging issue. Unless something is done quickly, the ability of Indonesian water utilities to serve rapidly growing urban populations is seriously at risk.

Infiltration Ponds

One promising intervention developed under IUWASH is to install infiltration ponds. Based on results under a pre-cursor project, the USAID Environmental Services Program (ESP), this technology holds much promise. ESP worked with local water utilities and community groups in Batu Karut and Cikareo in West Java. In Cikareo, ESP and community groups developed 20 ponds (each with a capacity of eight cubic meters) to harvest rainwater in order to bolster the rapidly declining production of the local spring. The communities went on to install 31 additional infiltration ponds themselves, with impressive results.

Science and Technology behind Infiltration Ponds

Constructing infiltration ponds is one of the easiest ways to artificially increase groundwater recharge. The infiltration ponds capture rainwater from upstream catchments that would normally be lost as runoff into nearby streams and collect it in small ponds, where the water can infiltrate into the ground and

Achievement to Date

USAID IUWASH, Coca-Cola Foundation Indonesia (CCFI), Nestle and partners have successfully built infiltration ponds as part of climate change adaptation efforts in these locations:

- **Sibolangit, North Sumatra:** CCFI, IUWASH with local community and JKM (local NGO) have constructed 473 infiltration ponds to support raw water supply for Water Utility of Medan in June 2013.
- **Pematang Siantar, North Sumatra:** CCFI, IUWASH and the Water Utility of Pematang Siantar City have built 291 infiltration ponds by the end of 2013 in PTPN IV Marjandi land and the local community’s yard.
- **Mojokerto, East Java:** CCFI, IUWASH, Perum Perhutani, Water Utility of Mojokerto district with the YLHS and local community have constructed 900 infiltration ponds by February 2014 in the Villages of Celaket, Padusan, and Kembang Belor in Pacet subdistrict.
- **Salatiga and Semarang, Central Java:** As of March 2015, CCFI, IUWASH, SPPQT (local NGO) and the local community have constructed 920 infiltration ponds in Senjoyo spring recharge area.
- **Malang, East Java:** As of December 2015, CCFI, IUWASH, YBUL (local NGO) and the local community have constructed 800 infiltration ponds in Ubalan, Mlaten, Polaman and Sumber Jodho recharge area.
- **Probolinggo, East Java:** 100 infiltration ponds will be constructed by February 2016 with assistance of Nestle.
- **IUWASH:** 97 infiltration ponds are constructed with IUWASH funding in locations of Serang, Probolinggo, Batu and Bantaeng.

recharge the aquifer. The water stored in the aquifer can then be used during dry periods, either to fill shallow wells or to feed spring intakes for downstream users.

Through a partnership between IUWASH, CCFI and local non-governmental organizations (NGOs), a total of 3,403 infiltration ponds have been constructed in Sibolangit, Pematangsiantar, Mojokerto, Salatiga, Semarang, Malang, Serang, Probolinggo, Batu and Bantaeng. In addition, 100 infiltration ponds are being constructed in Probolinggo District with Nestle funding. These programs are intended to recharge the water springs used by local water utilities (PDAMs). Some local NGOs involved in this program include: JKM (Jaring Kesehatan Masyarakat) Medan, YLHS (Yayasan Lingkungan Hidup Seloliman) Mojokerto, SPPQT (Serikat Paguyuban Petani Qaryah Thayyibah) Salatiga and YBUL (Yayasan Bina Usaha Lingkungan) Jakarta.

The constructed infiltration ponds serve to channel rainwater into the ground and thus recharge spring aquifers, addressing a critical problem of declining spring discharge that severely impacts the ability of many PDAMs in Indonesia to service current, let alone new customers. For example, Sibolangit Spring currently supplies about 20% of water for the City of Medan (with a population approaching three million people). However, over the last 10 years, water discharged from Sibolangit Spring has decreased by about 5% per year. If this continues, the PDAM will soon lose one of its main sources of water. Not only will this have a negative impact through the loss of a key source of water, but it will hamper the attempts of the City to improve sanitation conditions which also rely on the availability of water.

Each pond has a volume of eight cubic meters (2x2x2m). Based on local rainfall patterns, these ponds are each expected to fill about 100 times a year (using a conservative estimate of 25 weeks in the rainy season). Therefore, 800 ponds will recharge the aquifer at a rate of around 600 million liters per year, which will be sufficient to meet the needs of at least 7,500 people.

Role Played by NGOs and Local Communities

Taking action to significantly improve the environment has to involve a wide range of stakeholders. In term of groundwater restoration through infiltration ponds, the effective approach has been to work through local NGOs with community members living nearby the infiltration ponds site. Local communities are the long-term stewards of the natural environment and their role in such programs includes assisting in site selection, participating in infiltration pond construction, overseeing long-term monitoring and conservation efforts in the area. These communities often experience the benefits of their involvement directly, as their wells and springs recover.

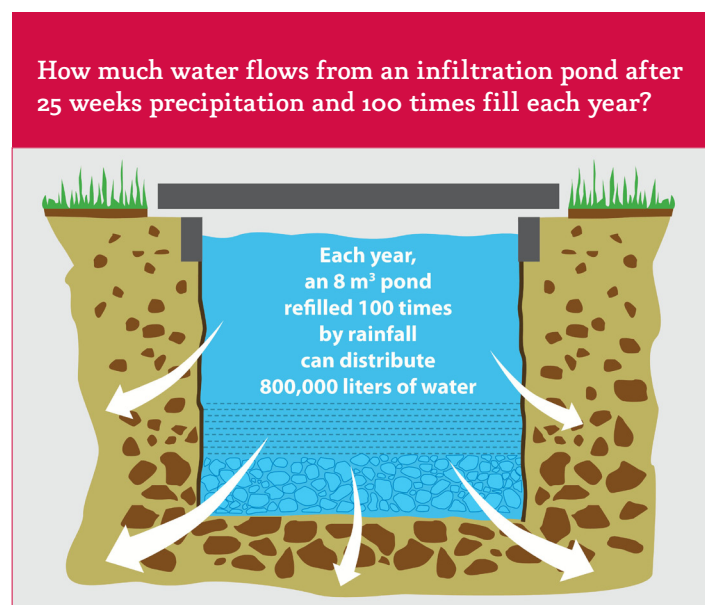
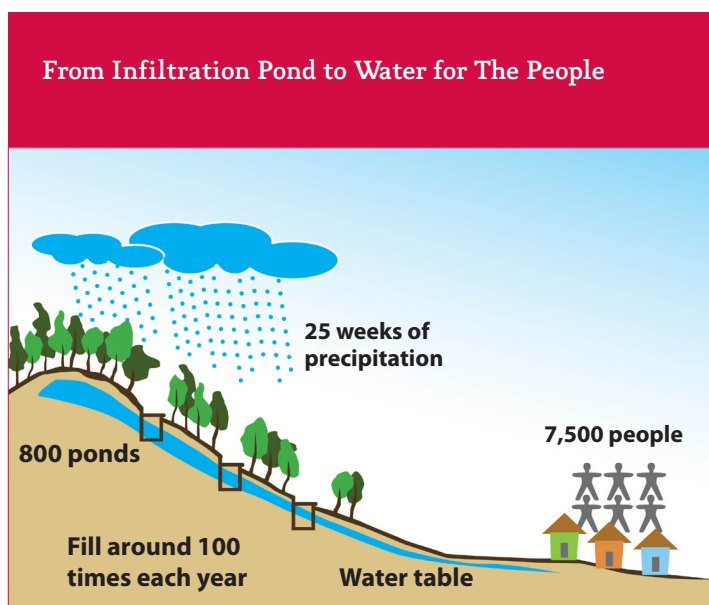
It makes good sense to involve local NGOs in these projects, as they have the necessary understanding of the local context and culture. Local NGOs tend to be far more effective than outside agencies, since they are able to (i) facilitate communications among the local utilities and communities; (ii) train community members in construction techniques and provide quality control; (iii) promptly address any problems that arise during implementation; and (iv) develop appropriate conservation programs to ensure the long-term environmental integrity of the new schemes.

Links to Climate Change

Affected by sea-level rise to changing rainfall patterns, fresh-water supply in Indonesia is highly sensitive to the impacts of climate change. Assisting local governments and service providers in reducing vulnerability to climate change is essential to the sustainability of IUWASH activities. Local water utilities are on the front line in efforts to mitigate or adapt to the wide-ranging effects of climate change.

The Indonesian Government has allocated substantial resources to help local governments and water utilities secure and protect the necessary water sources to meet current and future demand. However, to access these funds, local governments need to have both realistic investment opportunities and sufficient levels of commitment.

The IUWASH team is currently conducting climate change vulnerability assessments in target municipalities, and identifying possible measures that these municipalities can take to ensure they have the raw water required to serve their growing populations. Infiltration ponds represent one solution that is simple yet potentially very powerful, and easy to replicate.



Technical Notes Infiltration Pond & Water Supply

Indonesia Urban Water, Sanitation and Hygiene (IUWASH) is a five years development project funded by U.S. Agency for International Development (USAID) and implemented by Development Alternatives, Inc. (DAI).

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