



International
Labour
Organization

Local Investments for Climate Change Adaptation

Green Jobs through Green Works

The climate is changing

The effects of climate change are being felt the world over. Some areas are experiencing longer and more pronounced droughts, while other areas receive more intense storms and increased flooding. Some hard hit areas are suffering from both: droughts and floods. The affected communities need to adapt to the environmental, economic and social implications of these climate variations.

People in different parts of Asia Pacific will be affected by climate change in different ways. Climate change will impact on their water supplies, flood risks, health, crop yields, livelihoods, living conditions and transport. Both urban and rural areas will be affected.

Efforts to support a just transition to a more sustainable and equitable development model are required and attention needs to focus on real approaches for addressing issues related to the social dimensions of climate change and increasing the resilience of communities.

A just transition

Helping affected populations and especially poor communities to adapt to changing weather patterns is necessary to safeguard and improve their livelihoods and living conditions. With the right investments and actions it is possible to protect the environment and mitigate climate change, while building a resilient and vibrant economy that provides jobs for local communities.

People will adapt through changing their habitats, behaviour and livelihood activities. Although communities have always been exposed and had to adapt to climatic conditions, new plans, programmes and projects to mitigate climate change and its impact need to be conceptualized, formulated, implemented and sustained. Efforts to mitigate climate change and its impact should be inclusive

of poor communities and help them to adapt to the new living and working conditions. Communities can use local resource-based strategies to reduce the impact of development on the climate.

Green Jobs

A significant effort of ILO in supporting such a transition is the Green jobs programme. The ILO agenda for Green Jobs seek to promote a socially just transition, in which vulnerabilities, changes in the labour market and new business models are addressed through an inclusive social dialogue.

Green Jobs exist in every sector of the economy and involve many different levels of skill and occupations. Green jobs help reduce negative environmental impacts, ultimately leading to environmentally, economically, and socially sustainable enterprises and economies. More precisely green jobs are decent jobs that:

- Reduce energy & raw material consumption;
- Limit greenhouse gas emissions;
- Minimize waste and pollution; and
- Protect and restore ecosystems.

Green jobs through green works

The development of local infrastructure and public works play a major part in adaptation to climate change. There are three main areas for adaptation, including:

- Water and soil conservation through resource management to address the variability and intensity of water supply and improve the quality of existing land through community forestation, irrigation and watershed management.

- Flood protection infrastructure to manage the variability and frequency of water availability in urban and rural areas.
- Rural transport improvement and maintenance to ensure that rural road networks can withstand the increased level of rainfall and flooding.

The ILO has demonstrated a range of tools that can be used in the planning, preparation and implementation of such works. Guidelines and training manuals have been developed for capacity building and implementation. Activities traditionally take place within the context of rural development, urban low-income settlement upgrading and crisis response. Now there is a need to place this work in the context of climate change adaptation and Green Jobs.

In the following pages there are examples of how communities are adapting to the changing climate as well as examples of tools and resources that can be used to help formulate strategies for adapting to climate change and promoting Green Jobs.

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Case study: Green investments for sustainable villages and green jobs

Indonesia's Ministry of Manpower and Transmigration is currently implementing a programme titled "Employment-Intensive Investment in Productive Infrastructure", which provides communities with infrastructure investment that use employment-intensive approaches and entrepreneurship training to empower local development.

The programme is active in over 360 locations across Indonesia and works with community groups using a community-driven development model.

Bedukan village in Bantul district, Yogyakarta



One location in which this programme is implemented is Bedukan village, situated in a rural area alongside the Gajah Wong River in Bantul, Yogyakarta. Most of the community members in Bedukan derive their livelihood from the agriculture and livestock industries.

With seed funding from the Ministry of Manpower and Transmigration, the Bedukan community has set up a community-based association called "NITI REJEKI", which focuses on developing a centre for livestock rearing, including cows, goats, and poultry. Since 2009, NITI REJEKI has been able to increase its productivity threefold.

In 2011 NITI REJEKI began diversifying its activities and experimenting with clean technologies, such as biogas and solar power. Using manure from the livestock activities, a biogas system has been installed which provides cooking energy for families within the community. A solar panel has been installed to fuel an incubator for supporting development of a women's group that works in the poultry industry.

The community is aiming for zero waste and has been developing creative solutions for managing waste. For instance, by-products from the livestock and agricultural sector are being used to manufacture organic fertilizers, which are then used for supporting cultivation of food crops.

The Bedukan community is now focusing on further developing skills and knowledge on sustainable farming practices in order to support development of their livelihoods and create open employment.

Environmental sustainability: A master plan

for becoming a green village The village is situated downstream from the source of the river and during the dry season the flow of the river is often not high enough to support the irrigation of crops. In the wet season the river has been known to break its banks and the community can become flooded. These fluctuations have affected the livelihoods and living conditions of the villagers in Bedukan.

To support the community to manage the changing weather patterns and build a more sustainable development model, the Ministry of Manpower and Transmigration is providing support for the village to develop and implement its master plan for becoming a productive green village.

The master plan includes investments in infrastructure to increase the resilience of the community through developing 1) a retaining wall along the river to prevent flooding and 2) a simple watershed management system for collecting flood water, which could later be used to support the irrigation of crops. These two initiatives, which use appropriate technology, are helping to support local development through optimizing the community's ability to sustainably increase their agricultural productivity.



In the short term these investments have generated a substantial number of "green jobs" for community members, and in the long term the community will benefit through having increased access to reliable water resources that can be used to support agricultural activities.

In the long term, Bedukan hopes to become an example of best practice for becoming a green village in Indonesia. The community hopes that its integrated livelihood development programme would allow it to develop into an eco-tourism destination.

A vision of green rural development

The vision underlying the "Employment Intensive Investment in Productive Infrastructure" initiative is to create employment in rural areas while encouraging communities to live in harmony with the natural environment. The approach adopted incorporates infrastructure investment, entrepreneurship training, appropriate technology and environment conservation. The programme creates options for community members and youth to become engaged in the local world of work, thereby lessening the pressure to migrate to the cities and improving the living standards within the village.

What is more, this programme demonstrates that green rural development provides not only sustainable jobs, but also helps to conserve the environment and restore the ecosystem. The appropriate technology used throughout the programme, such as biogas and solar panels, is a simple, yet smart way of bolstering both the livelihoods and environmental conservation components of inclusive development.

A key strategy of this programme is the empowerment of community members through investments in infrastructure and skills to support job creating within the period of the programme and beyond. Community members themselves decided which types of activities are best for the village and work together to achieve their plans.

Case study: Green development through community forestry

In the 1970s forest areas in Gunungkidul, Yogyakarta, Indonesia had been significantly depleted, subsequently soil quality had been affected by erosion and systems for managing water conservation were poorly developed. In 1986 the Ministry of Forestry took action to rehabilitate an area in Gunungkidul that has been severely deforested.

The approach taken by the Ministry of Forestry sought to actively engage surrounding communities in the reforestation process. The community and the Ministry of Forestry made a decision to reforest the area with productive vegetation (pine and Melaleuca trees) in order to balance the conservation, social and income generating needs of the forest to increase the community's welfare. The reforestation of the area has helped to address problems associated with erosion and need for conservation, while offering communities opportunities to work and generate income.

Moreover, the planting of Melaleuca trees have also resulted in the building of both traditional and modern factories to process the leaves into oil, further boosting the community's income.

Sustainable use of forest resources: Tapping pine trees

Of the 130 hectares of forest, community members tap up to 100 hectares of pine trees to extract resin, which is then sold to a trader for further processing. The Ministry of Forestry gives the community access to the forest using a quota based system, with 100 community member provided with a quota of 600 to 700 trees that they are to maintain. Community members spend approximately four hours per day on maintaining the forest and tapping the resin. Each of the community members is able to extract between 75kg and 125kg of resin from the pine trees per week, which provides an income ranging between 150,000 IDR and 250,000 IDR.

In addition to the pine trees, communities are also able to plant food crops among the trees, such as corn, peanuts, soy and cassava. This intercropping system has allowed for a rich mixture of nutrients in the soil of the forest floor as well as efficient use of available land.

As the community is involved in managing the forest and has a framework for using forest resources in a sustainable manner, there are no problems associated with illegal logging in the area. Community members are linked to stable markets for selling their produce, which helps to ensure that the forests will continue to be sustainably managed. Since rehabilitation the area has had a pleasant micro-climate and has become a tourist destination,



with many people going on camping holidays to enjoy the beauty of the area.

Community-based Melaleuca oil production

Melaleuca oil, also known as 'Cajuput oil', is a natural antiviral, antibacterial and antifungal oil that is widely used to help relieve cold and flu symptoms and other types of infections.

Cajuput oil is obtained through the refining the Melaleuca leaves, which is gathered from

approximately 4,000 hectares of forest, supplying two modern factories and two traditional factories. Every day a total of 34 tonnes of leaves are collected from approximately 170 community members and the leaves are delivered to collection points and weighed for payment. The leaves are then taken by truck to a small processing factory. In total the initiative provides approximately 220 people with work on any given day. The Ministry of Forestry estimates that in total the initiative reaches approximately 10,000 people in the region.

Effective management of waste products from the processing of the Melaleuca leaves is a priority of the Ministry of Forestry. To manage organic waste the processing plant uses power from the burning of leaves that have already been processed. The used leaves are also used to develop compost that is used by the community nursery to propagate seedlings that support the further expansion of reforestation activities in the region. The rest is used by the communities for their cooking needs.

Sustainable agro-forestry in a changing climate

The price of cajuput oil has been steadily increasing over the years, which helps to ensure that the community uses the forest resources in a sustainable manner. In 2010 the price for tea-tree oil was 117,200 IDR per litre and in 2011 the price rose to 145,200 IDR per litre. In total the Melaleuca agro-forestry area in Gunungkidul generated approximately 5.3 million USD in revenue for the region. This income is significant capital for sustainable forest development as well as having a positive impact on the community's welfare.

This community forestry programme demonstrates how well the intersection between livelihoods

and forestry can work together in both mitigating and adapting to climate change. Green cover has significantly improved within the area, which is further enriched with the intercropping system of various crop plants.

At the same time, with this supplement of income, community members have an alternative of livelihood that also acts as a measure of adaptation to shocks created by climate change and varieties in weather patterns.

Publication: Local investments for Climate change adaptation

Where communities live there is infrastructure and how this infrastructure is developed, maintained and used has important implications for climate change mitigation and adaptation. 'Local investments for climate change adaptation' provides a guide for the identification, design and implementation of interventions in support of climate change adaptation at the local level. It promotes a local resource-based approach for infrastructure development, which adds value by using environmentally-friendly methods for constructing and maintaining assets, while providing employment opportunities and enhancing the capacity of governments, contractors and communities.

'Local investments for climate change adaptation' provides practical solutions for helping to build more resilient communities, with focus given to:

- Irrigation and water and land resource management in rural areas to address the variability and intensity of water supply and improve the quality of existing land. This includes community forestation.
- Flood control, drainage and water conservation structures both in rural and urban areas to deal with the variability and frequency of water availability.
- Rural transport improvement and maintenance to ensure that transport networks can withstand the increased level of rainfall and flooding.

The effects of the changing climate are already felt around the world. Helping affected communities and especially poor communities to adapt to these changing weather patterns now is necessary to reduce future impacts on their livelihoods and living conditions.

Some excellent examples of local investments that support climate change adaptation include the Nias Islands Rural Access and Capacity Building Project, in which local contractors and community members are constructing roads and bridges in villages that use locally available resources and sustainable practices; the Community Forestry project in Gunungkidul implemented by the Ministry of Forestry; and the "Employment-Intensive Investment in Productive Infrastructure" programme of the Ministry of Manpower and Transmigration in which both local investments and flood protection projects are implemented as a form of climate change adaptation.

The Green Jobs in Asia project in Indonesia

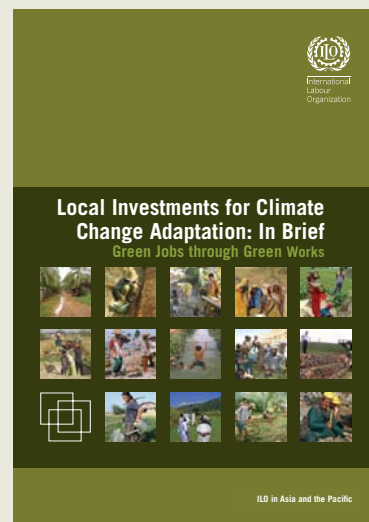
The 'Green Jobs in Asia' project seeks to deepen ILO's constituents understanding and commitments for the promotion of gender sensitive green job opportunities and a just transition for workers and employers in order to build a low-carbon, climate resilient, environmentally friendly development. The project is being implemented in Bangladesh, Indonesia, Nepal, the Philippines, and Sri Lanka over a two-year period.

In Indonesia, eco-tourism is an emerging sector within the greater framework of Green Jobs. It is particularly

relevant within the Indonesian context, which is endowed with rich natural and cultural resources, creating the ideal condition for the development of eco-tourism. To support the development of eco-tourism, the Green Jobs in Asia project has provided a "Training of Trainers" activity for eco-tour guides in East Java and North Sumatera. The participants, many of whom were seasoned tour guides, learned about the concepts of eco-tourism, the national work competency standards, environmentally-friendly principles, and educational principles, among others. Throughout the four-day training, they also learned practical skills in education, tour-guiding, and safety and first-aid.

This "Training of Trainers" activity serves as an excellent opportunity to enrich Indonesian tour guides'

understanding of eco-tourism, while empowering them to educate their peers and community members on the importance of environmental conservation through tourism. Moreover, since the training was anchored to the national competency standards, the participants gained critical skills in improving their competencies and professionalism specifically tailored to eco-tourism. With increased knowledge and skills in eco-tourism, Indonesian tourist guides are leading the path to the proliferation of eco-tourism concepts and practices. Through further training and awareness-raising, eco-tourism can flourish and become an important sector in developing Green jobs in Indonesia and support the Government's sustainable tourism initiative.



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