

**Contribution by Christian Asse, expert in educational development involved in research on educational methods adapted to indigenous populations – France-**

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The following proposals take into account the case of indigenous populations who are victims of climate change, which has also led to an increase in migratory flows. They are intended to contribute to the implementation of programs to mitigate the effects of climate change.

All indigenous communities are subject to highly vulnerable conditions, both economic and cultural, but some still have traditional knowledge to adapt or to mitigate the effects of climate change. This knowledge has fostered the ability to adapt to new situations, and has played a significant role over the years in solving problems, including those related to climate change and variability.

In terms of adaptive capacity, examples include the relocation of agricultural activities to new settlements, less subject to harsh climatic conditions, or the creation of floating vegetable gardens in flood-prone areas to prevent that livelihoods are destroyed.

In terms of limiting the effects of climate change, there is the initiative of the Moklen people of Thailand, integrated in the Phrathong Island National Park, which, after the 2004 tsunami, restored the ecosystems by closing the freshwater ponds. In Vietnam, communities have also contributed to the planting of thick mangroves along the coast to mitigate the impact of increasingly frequent storm surges.

Traditional knowledge is thus useful for ecosystem conservation, and thus for limiting climate change, as a healthy ecosystem contributes to its own microclimate, which in turn influences the climate of a wider area. They can, however, be limited by overly important effects of climate change. Their combination with recent scientific knowledge is interesting for achieving greater efficiency.

The idea behind this contribution is to ensure that vulnerable communities move from the status of victims of global warming to those of actor of climate change mitigation.

***The proposed action will be based on activities to protect the remaining ecosystems and restore some degraded ecosystems. It will be combined with sustainable economic activities that will also contribute to the reorganization of biodiversity. Forests and oceans whose ecosystems are maintained in good health represent, for example, a high potential for climate regulation.***

This reversal of the situation is not obvious, however, especially for the communities that are losing their traditional values.

These latter communities need to be sensitized and given technical, organizational and financial support to carry out activities effectively and over a long period of time.

The populations are essentially seeking to find both living conditions as they existed before climate change but also to improve their overall standard of living. The percentage of indigenous people living in extreme poverty is indeed 30% and this vulnerability can increase the migration rate in the event of a climatic problem.

The expressed needs include, for example, access to decent work opportunities and quality education and care. As such, the United Nations 2030 Agenda for Sustainable Development sets development goals specific to indigenous peoples with, in economic terms, doubling the incomes of small producers by 2030.

***A long-term project, allowing communities to really get involved and using their traditional knowledge combined with scientific techniques, will generate hope to find a favorable environmental situation and allow people to feel they are agents of change.***

Examples of successful experiments exist in many areas, such as the restoration of coastal ecosystems, coral reefs, degraded lands and forests. The example of the transformation of degraded lands into functional forests for marginalized communities in the Indian Araku Valley is interesting because it represents a situation frequently encountered in Sahelian or semi-desert areas

#### Transformation of degraded lands into functional forests in the Araku Indian Valley

The project took place in Araku Valley, located 1200 m above sea level in eastern India, which suffered massive deforestation during British colonization, resulting in considerable erosion and soil degradation. This degradation led to the poverty of Adivasi populations, considered to be among the most heavily disadvantaged groups in India. These populations traditionally cultivated coffee, but with a low yield.

Soon, the disappearance of the forest was identified as the link between the problems of crop yield and poverty of Adivasi populations. An integrated approach has been implemented to act jointly on agriculture, education and social link. An agroforestry component has thus been implemented in 300 villages corresponding to a population of 100,000 inhabitants. Three million fruit trees were planted to restore the land and three million coffee trees, all on more than 6,000 hectares, the fruit trees providing shade for coffee.

The seedlings were produced in local nurseries and distributed to the inhabitants to reforest selected areas with the help of forestry experts. 14,000 farmers have been trained in sustainable farming practices to enable them to take care of planted trees while preserving their ecosystem. They learned how to produce compost and fight disease and pests without chemicals.

A cooperative has been established by the NGO to assist local coffee growers in their sales strategies to help them increase their daily income. Thus, the coffee exported internationally under the label "Araku" of Naandi is certified "organic" and "fair trade", which increases the income significantly.

The Adivasi were able to diversify their crops with 18 varieties of fruit trees, which enhances their food security and generates new income through the sale of surpluses. Thus, they currently produce about 12,000 tonnes of mangoes a year for the local market. From the three million replanted coffee trees, they produce a high quality coffee with organic methods. Part of the former degraded lands have been transformed into functional forests that provide food and income. The restoration of 6,000 ha of degraded lands has also helped restore

habitat for local flora and fauna, especially endemic birds. On the other hand, planting 6 million trees will sequester about 1.3 million tonnes of CO<sub>2</sub> over 20 years.

The implementation of such strategies in areas that have been identified as sensitive both in terms of the environment and the vulnerability of the population requires relatively large funding. Respect for the environment can be expressed in financial terms, and jobs linked to "green" professions working for its conservation and restoration, in economic opportunities. The preservation of forests associated with reforestation activities represents for example a service that can be valued between 20 and 35 euros per ton of CO<sub>2</sub> avoided. Thus, the value of the 1.3 million tonnes sequestration of the Adivasi forest would be between 26 and 45 million euros.

In economic terms, an investment in projects of this type is thus much more efficient and cost-effective than the cost of inaction, depending on environmental degradation, as well as the risk of increasing the poverty level of the populations. Thus, it can be of great benefit to the international community to fund ecosystem restoration projects for the benefit of indigenous communities. "Carbon" credits, financed from public and private funds, represent a financial opportunity to support communities whose wish is to preserve the ecosystems of their natural environment.

***Education, and particularly vocational training in green professions, can mobilize younger generations to practice trades that are in tune with Aboriginal culture.***

In most countries with indigenous populations, educational statistics show low enrollment rates, high drop-out rates and often below average levels of education. Some young aboriginals are in a state of malaise, which can manifest itself in a dramatic way. For example, it has been established that suicide rates for these youth are significantly higher than for non-Aboriginal people. For example, this rate is 5 to 7 times higher in Canada among First Nations people than it is for all young Canadians, especially those aged 13 to 22.

According to some Aboriginal elders, the neglect of culture and customs is the main cause of the malaise of youth, resulting in a loss of reference in communities. The challenge for the part of the youth that wishes it would be to be able to build a future in a context that corresponds to some expected of the modern world, but rooted in the natural environment and cultural heritage. The use of new technologies associated with traditional knowledge may be of real interest, especially in an ethical context, with participation in limiting climate change being a major challenge for the entire planet.

This future must also offer guarantees for well-paid jobs, since indigenous peoples are often discriminated against in accessing the labor market. In a context of migratory movement associated with climate change, the desire to stay in the area must be associated with a profession considered to be able to live with dignity. The trades associated with the maintenance and restoration of ecosystems, as well as the green trades that allow the sustainable exploitation of natural resources, could thus meet the expectations of Aboriginal

youth positioned in or near protected areas. These areas are so far known to not offer employment opportunities and difficult access to education. For a successful completion of the vocational training strategy, pedagogical approaches must be adapted to specific learning and innovative profiles, in order to foster a link with the natural environment, to enhance indigenous culture and existing knowledge.