FACTSHEET

CUBA – Generation and adoption of Agroecological Pest Management (APM) system in the Cuban agriculture (1993)

IN BRIEF

This practice aims to increase the capacity of self-regulation of pests and to increase the capacities of farming in Cuba, specifically by diversification of the use of biological control agents, integration of soil management using rotation systems, soil laboratories, design and management of the cultivation with polyculture or mixed cultures, cultivation of natural enemy pest regulation and increasing biodiversity by enhancing the complexity of the production systems matrix. Since its inception, APM has spread to a point where today, 75 % of the agrarian production of the country now use biological control agents and other alternative methods of control under APM systems. A similar programme (pest management) is being conducted in Nicaragua and will give results within 1-2 years.

ABOUT THE PRACTICE AT A GLANCE

Organisation: Plant Health Research Institute (Instituto de Investigaciones de Sanidad Vegetal-INISAV). Ministry of Agriculture-MINAG
Implemented in: Cuba
Year: 1993
Beneficiaries: Small holders, urban farmers, natural systems.
Topic(s): Production, Inputs

PROBLEMS TARGETED / CONTEXT

After the fall of the Soviet Union, the Cuban agriculture has experienced a deep crisis. Indeed, the convectional and input-dependent Cuban agriculture was heavily depen-

dent on material imported from socialist countries. Since they were no longer available (US embargo) and since the Cuban population faced the danger of starvation, Cuba had to simultaneously increase food production and reduce or eliminate inputs. To do so, Cuba adopted as national policy an alternative agricultural model, referred to in the United States as low input sustainable agriculture.
Agroecological pest management was developed in parallel to the alternative agriculture (ecological, traditional, agroecological), promoted by researchers and peasants, and encouraged by the state to accelerate the national production of foods. From 1993 to 2016, several research and co-innovation projects were developed in five municipalities around Havana, with the collaboration of 10-15 farmers. The scientist evidence for the Agrological Pest Management was developed mainly in peasants' proprieties, and in orchards of urban agriculture. From 2003-2008, a co-innovation project supported by health specialists, technicians of farmer's organizations, and farmers, organized a movement of initiatives in APM. Thanks to the start of the Suburban Agriculture Programme, APM grew considerably since 2009 and was strengthened by additional policies later in 2011-2015. Now it is being implemented under the state programmes to combat climatic change and urban food production policies, both with great priority on the sustainable food production around cities.

KEY FEATURES OF THE SOLUTION

The two major goals of APM are, first, to increase the capacity of self-regulation of pests in fields and, secondly, to increase the management capacities of farmers on their properties.

In order to regenerate quality of the soil that had been impoverished (salinization and erosion) after years of high input farming, soil management techniques were integrated into APM. Cuba carried out an exhaustive survey of soil content and quality in all regions, and measures to rectify soil quality. These involved the increase of soil organic matter content through vermiculture and other biological fertilizers, and the reduction of erosion by means of tillage reduction and reforestation.

Much research has been conducted in the field of plant disease management and in the utilization of microbial antagonists against plant diseases. In addition, auxiliary vegetation is integrated around the cultivation in order to facilitate pest regulation, and botanical pesticides were elaborated according to traditional methods. Insect management and extensive monitoring of crop pests are conducted, as well as techniques for the evaluation, production and deployment and natural enemies have now become a standard practice.

Cuba also developed modelling programmes in weed management, allowing prediction of likely weed species and densities. Based on model predictions, crop mixtures and crop rotations that will reduce the impact of these weeds are designed. The complexity of production systems allowed an increase in biodiversity.

The practice is implemented under scientific direction and the project is facilitated with scientific equipment although the Plant Health Research Institute (INISAV). From 2008 until the present time, APM is implemented in the country through: the net of 76 Territo-

rial Stations of Plant Protection (ETPP) of the state service of plant health of the Ministry of the Agriculture; the Agroecological Movement of Peasant to Peasant (MACAC) of the ANAP (National Association of Small Farmers) and the National Programme of Urban, Suburban and Family Agriculture of the Ministry of the Agriculture.

INNOVATIVE ASPECTS

• Promotes the understanding for specialists, technicians and farmers of the contribution of agroecology to creating capacity of self-regulation of pests in the agricultural production system.
•Transforms gradually the matrix of the production systems, to increase their complexity and functionality.
• Grants bigger capacity to farmers in the fight against the pests and reduces their dependence of external inputs.
• With state support, this system has spread across the island.
• Employed in urban as well as rural areas.

FACTS & FIGURES

• From 2003-2008, 30,780 farmers were trained in a co-innovation project (national workshops, territorial encounters) and diffused APM to other farmers of their municipalities. 29 specialists of plant health were formed as facilitators of APM. 1,704 specialists and technicians of plant health were qualified at municipal level and 2,736 technicians that work farmer's organization were qualified in APM. 10 support tools were developed for training and recorded on CDs and videotapes; 2,700 copies were published and distributed, including 1,300, which were distributed to farmers' organizations. 5 editions of APM books were edited by different NGOs, and 3 editions by the Ministry of Education for the national agrarian schools.

• In Cuba, there are currently 383,000 urban farms, covering 50 thousand hectares of otherwise unused land. Using no synthetic chemicals (hence many apply APM), these urban farms produce 1.5 million tons of vegetables and reach a yield of 20 kg/m² per year of edible plant material, equivalent to 100 tons per hectare.

• Increase of the diversity and regulatory activity of natural enemies (25-35%) and the establishment of the biological control agents that are applied by augmentative methods (this last one as national programme from 1988, that at the moment is applied in 1.5 million hectares).

OUTCOME, IMPACT & EFFECTIVENESS

• APM has been adopted in approximately 373,800 hectares of the production system. 40 % of this surface (mainly urban agriculture, peasants, suburban farms) has adopted 4 APM components (diversification the use of control methods, integration the soil management with the plant health, design and management of the cultivation with polyculture or mixes culture, and integration of auxiliary vegetational around the

cultivation), whilst 22 % (mainly: traditional peasant, periurban farms, mountain farms) has adopted all APM components (the previous ones and increasing complexity of the production systems matrix).

• Increase of biodiversity and their function in the agrarian territories.

• Reduced costs of pesticides and pests. 75 % of the Cuban agrarian production now use biological control agents and other alternative methods of control under APM systems, whilst the rest of 25% uses chemical pesticides with biological control agents under IPM programmes.

• Increase of the diversity and quality of agricultural products.

• Between 1997 and 2010, about 1/3 of peasant families in Cuba came to participate in the movement for agroecology, which has since grown to 200,000 families (around half of the Cuban peasantry).

• Increases resilience capacity for extreme events of the climatic change.

OUTLOOK, TRANSFERABILITY, SCALABILITY & COST-EFFICIENCY

The costs of implementation encompass activities of local technicians' formation (20%), direct activities of co-innovation with farmers (40%), and changes that the farmers should carry out in the design and management of their properties (40%), determined according to local characteristics.
A part of the methodology, biodiversity diagnosis, is used in Nicaragua, and as of recently there is a cooperation project with Montpellier, France to hold workshops in order to qualify (mainly organic) farmers about farm design to facilitate pest regulation. A few universities impart a course on APM: from 2010 in the University of Antioquia-UDEA, Medellín, Colombia, from 2013 in the National University Agrarian-UNA, in Managua Nicaragua and from 2015 the University of La Matanza, Buenos Aires, Argentina.
Scaling up the practice implies the systemic training of technicians and the involvement of farmers. The first results are measurable in 2 or 3 years. But they depend on local context. An initial agroecological diagnosis is fundamental to design its application. It is also required to elaborate practical manuals and support in video format. Also, they would like to study the specific impact in farmers properties and urban agriculture orchards, but need financial support.

INTERVIEWEE FEEDBACK

Number of points: 20.5 out of 23
Summary: The interviewee well explained the principles of agroecology employed and the extent to which they have been researched and applied. However, due to some lacking figures on farmer livelihoods, lack of self-financing and lack of governance, some half points were withheld.

1 (Sustainable use of resources) – 5.5/6 – Agroecological principles of biological control, recycling of biomass, ecological self-regulation and productive biodiversity boosting were clearly present. Entirely funded by the state (0.5) – at farmer level it requires initial investment and is then rewarding.

2 (Equity and eradication of poverty) - 3.5/4 - Practice contributes to sovereignty and resilience. Less chemical inputs for farmers can be expected to mean less costs and higher returns. Increases the capacity of self-management of farmers. APM promotes local species/solutions and indirectly fuels local markets. Even though attractive for them, it has no particular focus on women or youth (0.5).

3 (Precautionary approach to human health, natural resources and ecosystems) - 2 / 2 – Questions not well answered, but it can be assumed that well implemented principles of agroecology ensure functional biodiversity for all. Risk is low and evidence of public consultation.

4 (Public participation and access to information) - 3/3 – Participative methodology used to facilitate communication. Work with farmers associations and fully appropriate for family agriculture and urban/peri-urban agriculture.

5 (Governance and human security) 2/3 – Transparency and effective, fair implementation assumed through national system and peasant cooperatives and urban/suburban agriculture programmes have adopted APM as a pest management model. Smallholders can adopt methods with ease and thus become less dependent on inputs in pest management. No evidence provided for mechanisms against corruption, bribery or unethical conduct (0).

6 (Integration, interrelationship- human rights, social, economic and environmental objectives) - 2.5/3 - Productive species, natural resource conservation (soil, water and biodiversity) supported throughout. Favours demands of ecological agriculture and market of sustainable products.

7 (Common but differentiated obligations) - 2/2 – APM is appropriate for tropical and subtropical regions and can be adopted to other regions. Socially it is accepted by its contribution to food sovereignty. Provides no burdens on any party and has been quickly adopted by urban and peasant agriculturalists alike.

CONTACT

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LINKS AND FURTHER READING

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