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# The role of local projects in the co-expertise process after a nuclear accident: fostering self-confidence and building the future together

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**Abstract**

After engaging residents in dialogue and performing radiological measurements, the third pilar of the co-expertise process focuses on the selection and implementation of local projects. These projects aim to improve the radiological protection of people and the environment, and to contribute to an improvement in their quality of life by maintaining and supporting the dynamic of the socio-economic activities. This chapter describes first the variety of local projects implemented after the Chornobyl and Fukushima accidents in four priority areas, namely health, radiological quality, economic development and education/memory as well as the level of partnership: individuals themselves, community level, regional level, national level and international cooperation. Secondly, the chapter discusses the key contributions of these projects relating to fostering self-confidence, restoring community life, contributing to well-being and ensuring vigilance and sustainability. In conclusion, ethical considerations and governance mechanisms to support local projects are highlighted.

## Introduction

The rehabilitation of living and working conditions in affected areas after a nuclear accident presents a double challenge. First, it is to provide adequate protection for the people and the environment, and secondly, it is to maintain

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and support the dynamic of socio-economic activities (ICRP, 2020). The feedback from Chornobyl and Fukushima has shown the importance of the direct involvement of the affected people and local communities, through the adoption of the co-expertise process fostering the cooperation between local residents and the experts (Thu Zar, 2022). In addition, it also highlighted the need to adopt governance mechanisms respecting ethical and social values, aiming to favour and support local initiatives within the recovery process (Lochard, 2016).

Radiological protection, although essential to protect people from radiation (i.e., those who have stayed, those who return, and those who settle for the first time) is not adapted to ensure socio-economic development. Experience has shown that the implementation of radiological standards in the deployment of a recovery strategy defined by national authorities are not enough to restore people's confidence in the recovery process, and that without the active involvement of all the stakeholders it is difficult to create a favorable dynamic (Lochard, 2013).

There are two major challenges in the recovery process. The first challenge is to ensure that radiological protection promotes individual well-being and the quality of living as a community. The second challenge is to ensure that local and national projects dedicated to socio-economic development take into account their radiological context, by contributing to the protection of people and the environment and by maintaining vigilance to ensure a sustainable future for the local population (Schneider et al., 2021).

Local projects constitute the third pillar of the co-expertise process. This pillar is essential for the completeness of the co-expertise process. It could be considered as the achievement of the co-expertise process: after engaging residents in dialogue and performing measurements to better characterize the local radiological situation, it is crucial to consider which actions could be undertaken to improve the radiological protection of people and the environment, and to contribute to an improvement in their quality of life. In this perspective, setting up local projects plays a key role and complements the two other pillars of the co-expertise process.

This chapter describes the variety of local projects implemented after the Chornobyl and Fukushima accidents, and then goes on to discuss the key contributions of these projects relating to self-confidence, living together, well-being and sustainability. In conclusion, ethical considerations and governance mechanisms to support local projects are highlighted.

# 1. The variety of local projects implemented after Chornobyl and Fukushima

## 1.1. *The domains of implementation*

Past experience has shown that the communities involved in co-expertise experiences after a nuclear accident are eager to develop local projects in all domains of daily life (Baudé et al., 2016; Lochard et al., 2026). Given the presence of radioactivity, projects in the field of radiation protection are obviously the most numerous, at least during the first years after the accident. Progressively

residents involved in co-expertise processes also invest time and effort in all areas relating to their quality of life, as well as the quality of life of their community. In fact, all aspects of life can be the subject of local projects. Making an exhaustive list would be of little interest, and it is preferable to rely on existing typologies. In this regard, the projects developed within the framework of the CORE Programme relied on four priority areas, namely health, radiological quality, economic development and education/memory. These four areas ultimately served as an operational framework to evaluate, select and monitor about 150 local projects, including: the decontamination and renovation of a playground for small children not used since the accident; establishment of a cooperative for the sale of cucumbers; the renovation of a pottery workshop to create a training center for young people to perpetuate the local tradition; the renovation of a local museum; and the development of a loan system for private farmers (Lochard et al., 2026). The following sections briefly present the main characteristics that not only provided a structure for the priority areas, but also underpinned the local projects.

### 1.1.1. Health

In the health domain, which is a topic of concern shared by all residents, it is interesting to note that the local projects are generally supported by the health system, traditionally focused on monitoring the health of the population. Local initiatives are therefore limited in number and generally focused on local events organized by medical professionals to promote healthy living and to conduct screening campaigns for example at schools. Thus, within the health care in Belarus, local projects were generally focused on the renovation of healthcare centers or the training of healthcare personnel. In Fukushima, local projects consisted of the construction of new hospitals in the municipalities that were long abandoned due to the evacuation orders, the commitment of nurses within local communities, notably in Kawauchi, and the involvement of medical doctors to accompany the whole-body measurements (Ando, 2016; Ando et al., 2026; Goto et al., 2018; Orita et al., 2014, 2026; Tsubokura et al., 2013).

### 1.1.2. Radiological quality

In the domain of radiological quality as mentioned above, the control of the level of radiation in the environment and in food products to protect the residents, gives rise to numerous private or collective initiatives at the local level. In this context, the most numerous local projects focused on measurements. Measurements showed that the initially high levels of radiation progressively decreased over time, and as this happened, the objectives changed to ensure vigilance, in other projects, so that they did not contribute to an increase in exposures for those involved and for the local population (Lepicard and Hériard-Dubreuil, 2001; Lochard, 2007; Ando et al., 2026). For example, during the installation of the exhibition in the Bragin Museum, the exhibited material from the restricted zone was carefully decontaminated to protect future visitors (Lochard et al., 2026). Those involved in the decontamination work were properly protected and used appropriate personal protective equipment.

### 1.1.3. Economic development

Over time, driven by the desire of residents who voluntarily chose to remain in the affected territories, to improve their quality of life, the local projects dedicated to economic development tend to proliferate. Indeed, given the economic context of the 1990s and 2000s in Belarus, in the territories affected by the Chornobyl accident, development projects primarily focused on agricultural production, aiming to improve yields, organize cooperatives to ensure product marketing, and provide access to appropriate financing mechanisms (Lochard et al., 2026). In Japan, the situation was quite different in the affected territories, even though agriculture and fishery were important traditional activities. Over time, in the non-evacuated part of the affected territories, the challenge has been to maintain activities and to address this, local projects have developed across the whole spectrum of economic activities from agriculture, fishery and food services to small, medium and large industries (Schneider et al., 2021; Igarachi et al., 2026; Yasutaka et al., 2026). In the municipalities that were long abandoned following the evacuation orders, it became necessary to rebuild local services such as public facilities, businesses, crafts, and small and medium-sized industries and in some cases, to establish new facilities for industry, but also for trade and leisure. It is evident at this level, that initiatives are mainly taken by local or even national public authorities, but for them to meet the expectations of the population, they must be discussed and developed in a participatory manner (Schneider et al., 2021; Tomkiv et al., 2026).

Box 1 succinctly presents how a large industry in the Iwaki region of Japan, located in a low-contamination area, had to cope with the post-accident situation in terms of radiation protection, in order to protect its staff and also ensure the continuity of its operations, which were largely focused on international trade (Orita et al., 2014; Schneider et al., 2021).

**Box 1. Iwaki manufacturing industry**

Although located outside the zone affected by evacuation orders and more than 40 km from the Fukushima-Daiichi NPP, an international company of Iwaki city specializing in the manufacture of car navigation systems, suffered from the consequences of the nuclear accident. The activities of the factory ceased in the first days following the accident and did not resume until 2 weeks later. About ten employees decided to leave the company between April and September 2011 in order to avoid exposure to radiation. Around thirty additional resignations were recorded until March 2014 (Yoshioka, 2020). While the majority of employees decided to continue working at the factory, many of them expressed concerns about the lack of information regarding the presence of radioactivity in their environment (Orita et al., 2014; Takeda et al., 2016). This led the company to implement various actions to provide answers to employees' questions and to help them to make their own judgment on the radiological situation. A series of lectures on radioactivity and its potential effects on health was organized until the fall of 2011, with the assistance of experts from Nagasaki University. Following these conferences, private consultations

with health professionals having an expertise in radiological protection were offered to the employees and their families so that they could express their concerns and questions about radioactivity and receive the appropriate information. The factory nurse was trained by Nagasaki University to resume and continue private consultations with employees and their families, as well as to ensure their long-term health follow-up. At the same time, ambient dose rate measurements were made using dosimeters installed in the plant. The results of these measurements as well as those of the contamination of the food served in the canteens were continuously displayed in the factory hall and on the company intranet. Partnership with Nagasaki University also organised access to whole body counting (WBC) measurements for the employees and their families. The 2012 and 2013 WBC campaigns showed that the estimated annual effective dose corresponding to the internal contamination measurements was between 0.01-0.06 mSv for the first screening and between 0.01-0.02 mSv for the second screening (Orita et al., 2014).

### 1.1.4. Education and memory

In the process of recovery, memory not only plays a role in remembrance but also serves as a living reminder to raise awareness, maintain vigilance, transmit the experience. It thus contributes to building the future. Capitalizing on the accumulated experience and making it accessible to all affected people, as well as sharing it internationally, is a moral duty. In this perspective, the involvement of the education system (schools and universities) is an essential means of transmitting the experience to the next generation.

**Box 2. The Bragin Museum**

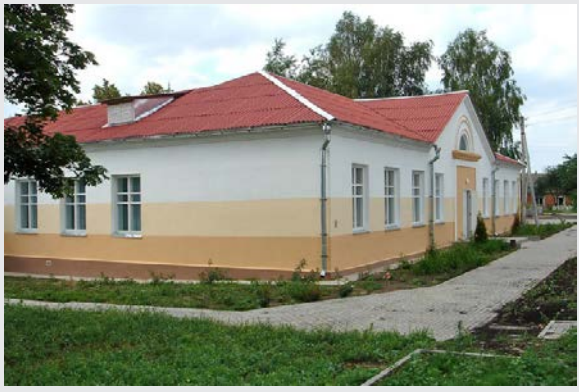

FIGURE 1. The Bragin Museum after renovation (photo: J. Lochard).

Within the education and memory priority areas of the CORE Programme, a group of residents, led by a librarian of Bragin, developed a project to refurbish the museum with the help of a French association specializing in heritage

preservation and the financial support of CORE. The project was ambitious, involving the renovation of the museum's four sections, including a permanent exhibition of works by painters native to the 30 km evacuation zone, an exhibition of objects from the same area, a room dedicated to the tribute of the young firefighter from Bragin who died in the accident, and finally, a space for temporary exhibitions, the first of which — entitled "The Lost Land" — remained in place for several years due to its success. It attracted numerous visitors, both local and from across Belarus and also foreign countries. This local project was developed in close cooperation with artists and museum professionals, most of whom were visiting the area for the first time since the accident. Discussions and meetings allowed for the development of a highly original narrative about the experience of local residents and the group gathered testimonies, documents, and photos to enrich the museum's collection.

Traditionally, the memory of Chornobyl is evoked by commemorations and tributes to the victims. This local project which focused on the meaning of the accident and the lives of those who live in the affected areas is an original approach to celebrate the memory of the accident, offering visitors another way to discuss the accident and experience the local situation. It also allowed for connections to be made between the past, the present, and the future.

## 1.2. *The levels of partnership and cooperation*

The local projects presented above show that the initiatives are taken by a large variety of stakeholders from individuals to international stakeholders. The origin of the local projects can come from different levels:

- individuals themselves in cooperation with a group of stakeholders at the community level, or by partners within an economic sector;
- at the community level by the authorities of the municipality on their own initiative or within the framework of the recovery policy set up at the national level;
- at the regional level, involving a group of local communities/municipalities, again on their own initiatives or under the leadership of the regional authorities;
- at the national level to create the conditions for the redeployment of social and economic activities in the affected region;
- in the framework of international cooperation by international organisations, government, authorities, research institutes or NGOs from foreign countries.

As illustrated by the governance framework set up within the CORE Programme, the multi-level partnership is important to ensure a fair and sustainable cooperation between all stakeholders, providing financial and technical support as well as contributing to the robustness and trustworthiness of the cooperation. Although such a framework is not easy to implement, the experience

of the local projects after Chornobyl and Fukushima has highlighted that the deployment of co-expertise process relies on the interaction between stakeholders from different levels to address the concerns and expectations of residents.

Whatever the type of partnership established, the focus should be on promoting and supporting local projects, where local citizens play a key role. Ensuring fair participation of local stakeholders and empowering them in these partnerships are crucial for the deployment of local projects within the co-expertise process. In this perspective, there is a need to promote a shared diagnosis of the situation in the affected territories and to elaborate a shared vision for the future. Furthermore, providing technical and financial support for the participation of local stakeholders is necessary for ensuring their sustainable empowerment (Thu Zar, 2022).

**Box 3. The Great East Japan Earthquake and Nuclear Disaster Memorial Museum**

The Great East Japan Earthquake and Nuclear Disaster Memorial Museum is located in Futaba, in the coastal area of the Fukushima Prefecture, very close to the Fukushima Daiichi Nuclear Power Plant currently undergoing decommissioning (Figure 2). It is a remarkable example of a large-scale State infrastructure project developed in the framework of the recovery process of Fukushima Prefecture in 2021, ten years after the accident. Its construction was completed as planned for the Tokyo Olympics in 2020, but the COVID-19 pandemic somewhat disrupted the opening festivities. This state-of-the-art museum offers a rich and immersive experience. Through exhibits, personal accounts, research, and interactive presentations, visitors can learn about the history of the region before, during, and after the disaster, deepen their understanding of Fukushima's revitalization and the decommissioning of the Fukushima Daiichi Nuclear Power Plant (TEPCO), and hear the stories of local residents.

The museum welcomes many visitors not only from the Fukushima Prefecture and Japan, but also from overseas. It regularly offers temporary exhibitions on various aspects of the accident. The museum director is a professor at Nagasaki University, and the museum regularly welcomes students from this university, as well as from other higher or secondary education institutions. It also offers seminars and symposia during which students and experts explore the museum together, as well as visiting the municipalities of the Hamadori region, which were the most affected by the accident.

Open to all, the museum offers numerous activities that promote civic engagement, involving Fukushima residents as well as a wider public, many of whom are learning about the situation in the prefecture for the first time. The museum is located near other museums, such as the Namie Town Ukedo Elementary School museum or the TEPCO Decommissioning Archive Center which together demonstrate the prefecture's commitment to preserving the memory of the past and preparing for the future.

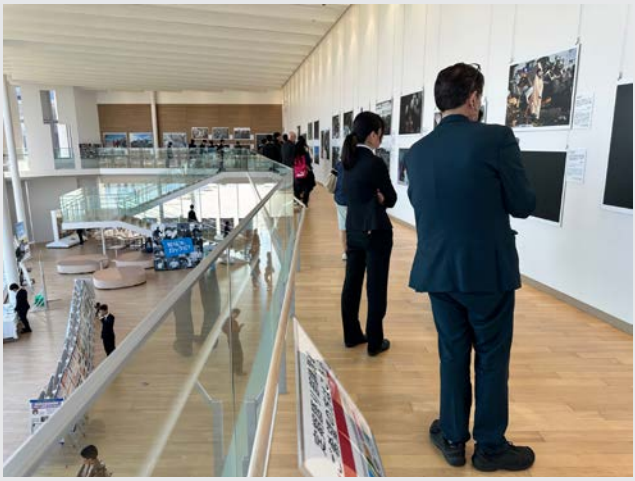

Figure 2. Inside the Great East Japan Earthquake and Nuclear Disaster Memorial Museum (photo: J. Lochard).

## 2. Contribution of local projects

Beyond their practical objectives (protecting individuals and the community, improving living and working conditions, etc.), local projects are a means for actors to build self-confidence, which was seriously impaired after the accident, and to look again positively at the future. To effectively implement these local projects, cooperation with the competent authorities, public and private organizations, experts and professionals is essential. Support for local projects requires the establishment of appropriate decision-making mechanisms to ensure the legitimacy, transparency and equity of their implementation.

The rehabilitation of decent and sustainable living and working conditions in the affected areas must necessarily be based on a "long-term vision of their development" co-negotiated between all the concerned actors: national, regional and local authorities, experts, scientists, professionals and of course the people directly affected by the accident (Baudé, 2016). The challenge is to create the conditions for the restart of social and economic activities damaged by the accident, to rely on the emergence of new and innovative activities in line with the local context and to favour and support local projects led by individuals and / or local communities, which must also aim to constantly ensure the radiological protection of people and the environment.

### 2.1. *Fostering self-confidence*

Confronting the presence of radioactivity caused by the accident deeply affects the self-confidence of the residents living in contaminated areas because it leads to a disruption to their daily life experiences and their ability to speak,

understand, decide, act and also to project themselves into the future. An accident is a traumatic event for individuals who, from one day to the next, struggle to express their feelings beyond the fact that they have great difficulty objectifying the situation they are facing. When self-confidence is impaired, self-esteem, which depends on the moral dignity of individuals — even if threatened — nevertheless persists and never completely collapses. This distinction between self-esteem and self-confidence, developed by Paul Ricœur in his book "Oneself as Another" (Ricœur, 1992) is very illuminating for understanding what is at stake in the dynamics of what he calls the "reconstruction" after a traumatic event (such as the death of a loved one or an accident) and which fully supports the co-expertise process.

For Ricœur, self-esteem is the capacity of each individual to recognize her/himself as a worthy subject who can act and be accountable for her/his actions. Self-esteem is a relatively stable existential given, even if it is sometimes threatened and silenced. As for self-confidence, it refers to what Ricœur calls the "capable subject", that is to say, individuals who can speak and enter into relationships with others in order to decide and act. Self-confidence when severely weakened, as it is the case after a nuclear accident, can never be rebuilt alone because it needs recognition from others. We never rebuild ourselves alone. This is why the co-expertise process with the deployment of local projects is fundamental. It allows affected individuals to rebuild their self-confidence and thus reintegrate into life. Through dialogue, residents regain self-confidence, through measurements of radioactivity, they objectify reality with others, and then through their involvement in local projects they can decide, act, and project themselves with their community into the future.

The dialogue and objectification of reality through multiple viewpoints, trigger the formulation of a local project and associated actions, which can be at the individual or the community level. Dialogue, measurements, and the local project are in constant interaction, each one feeding the other two. According to Ricœur, the co-expertise process does not aim to lead to a shared interpretation of reality. In this process, measurements provide a common ground for discussing and sharing visions that eliminate erroneous viewpoints on reality. That said, it only allows for an interpretation of reality and does not provide the truth. The development of a local project and its implementation then guide the continuation of co-expertise through dialogue and measurements that allow for the evaluation of project progress and the provision of support in case of difficulty. Thus, each project, whether individual or collective, translates, by the very nature of the co-expertise process, into a shared responsibility among all stakeholders involved and significantly contributes to restore self-confidence of residents.

## 2.2. *Restoring community life*

Rebuilding communities after a nuclear accident is a complex challenge encompassing all the health, social, and economic dimensions impacted by radioactivity. The experiences of Chornobyl and Fukushima provide valuable lessons on the crucial role that local projects can play in the process of rebuilding

the social fabric. To be effective, these projects must, as previously mentioned, address the specific needs of residents while contributing to their radiation protection and improving their living and working conditions in order to restore their trust in experts and authorities and give them back a sense of control over their future.

For example, the projects developed under the CORE programme in Belarus in the 2000s demonstrated that, economically, they could contribute to job creation and to the revitalization of local activities in agriculture, crafts, small-scale industry, and tourism (Lochard et al., 2026). In Fukushima, projects in the fields of agriculture, energy, and advanced technology (medicine, information technology, dismantling technics), gradually emerged in the years following the accident. In agriculture, while traditional farming has declined significantly, organic farming is steadily progressing with the arrival of young farmers attracted by the fact that the soils have remained free of chemical inputs for a decade (Yasutaka et al., 2026).

In the fields of education, heritage, and culture, the organization of festivals, exhibitions, and artistic events naturally fosters encounters and strengthens social cohesion. The gradual resurgence of festivals in the areas affected by the Fukushima accident, for example, illustrates how they have allowed families scattered during the disaster to reunite (Ando et al., 2026). The creation of memorial museums also contributes to maintaining intergenerational ties and encouraging visits to the areas by non-residents.

Some initiatives are taken by local communities while others are promoted through national programmes to support the resurgence of the local communities in areas affected by the accident. This clearly highlights the importance of promoting an integrated approach and in this respect the existence of co-expertise process within local communities clearly favours the involvement of residents and local communities in local projects. This has been observed in the ETHOS project and CORE programme as well as in several communities after the Fukushima accident such as Kawauchi, Suetsugi or Yamakiya (Ando et al., 2026; Lochard et al., 2026; Orita et al., 2026; Schneider et al., 2026; Yasutaka et al., 2026).

It is also interesting to mention the projects in the fields of research. They are generally decided and supported financially by the State. For example, after the Chornobyl accident, a research center was established in the 30 km exclusion zone around the power plant to study how animals and plants were evolving in a radioactive environment. In Fukushima, the Fukushima Institute for Research, Education and Innovation (F-REI) was recently created with the objective of conducting research in Fukushima to solve local issues and revitalize the region through value creation and to build next-generation human capacity for science, technology, and regional growth. F-REI will undoubtedly contribute to local economic, social and cultural initiatives with the arrival of researchers.

The local projects dedicated to the preservation of memory through workshops and field visits and the organization of archives of testimonies are also important to connect the different generations within the local communities. Furthermore, the organization of joint activities and exchanges between schools from contaminated and uncontaminated areas, as well as with other countries

has demonstrated how they are effective at creating interpersonal connections, and above all foster self-confidence among participants (Lochard et al., 2026; Schneider et al., 2026). There are also potential activities in the field of sports, such as the Kawauchi marathon, which attract thousands of athletes in the Kawauchi village every year who thus discover the affected areas and their inhabitants (Orita et al., 2026).

It is the accumulation of all the local projects, and their blending and interconnection, that ensures a favorable evolution in the quality of individual and community life in the affected territories, that eventually restores community life. This type of ambition needs time (it could be a matter of decades) and significant investment coming from state and regional funds, utilizing crowdfunding, and establishing public-private partnerships. Experience showed that, it is also essential to involve residents from the earliest stages in the decision-making processes, so they can propose local projects and express their views concerning their priorities and expectations, for example, for urban planning, infrastructure and industry projects contributing to the economic development, as well as the shaping of the territory for decades.

Clear communication is indispensable as well as regular updates on project progress. Notably, it is important to provide easy access to radioactivity monitoring results to ensure vigilance. Projects must be adapted to the evolving needs of the community, and all groups must be represented to ensure inclusion, including women, young generation, elderly and vulnerable people. Therefore, a governance structure tailored to the situation should be implemented with significant involvement of the local community.

## 2.3. *Contributing to well-being*

Well-being is generally defined as the state in which a person feels in harmony with her/himself and her/his environment, experiencing a sense of fulfillment, health, and quality of life. The World Health Organization defines well-being as a complete state, a state of physical, mental, and social well-being, and not just the absence of disease. According to Seligman, well-being includes elements such as engagement, positive relationships, meaning, accomplishment, and positive emotions (Selignman, 2002). These definitions emphasize that well-being is subjective and dynamic: what is important to one person at a certain moment may differ for another and also may evolve with life's circumstances.

For Ricœur, well-being is a necessary foundation which allows individuals to project themselves toward higher goals but is not a sufficient condition for ensuring good living conditions what he calls "the Good Life" (Ricœur, 1992; Verhoef, 2023). Good living involves self-esteem, being accountable for her/his actions but also concern for others, justice and participation in institutions. Ricœur does not reject well-being but for him a life reduced to just well-being ignores the ethical dimensions of living together. For Ricœur, who draws his inspiration from Aristotle and Kant good living is a tension between her/himself and others that allows one to transcend an individualistic vision of well-being in order to access a responsible life, open to others.

Nuclear accidents deeply impact individuals, communities, and territories. In this context, local projects involving communities become essential for restoring not only the quality of the environment but also the well-being/living conditions of residents. Fostering cooperation with others plays a central role, as no one can face the challenges of such catastrophes alone.

Following a nuclear accident, reconstruction projects — whether environmental, health-related, societal or economic — allow residents, workers, experts, professionals and authorities to come together around common objectives and projects. Examples are numerous (see Section 2) and include: citizen initiatives for measuring radioactivity in order to make choices about the economic or social activities; and dialogue meetings to discuss the future of the territory and to identify local projects addressing the priorities for the future. These projects restore self-confidence and the dignity to those affected while strengthening community life.

Nuclear accidents generate lasting trauma, fear of health consequences, stigmatization, and loss of bearings. Local projects that incorporate psychological support, such as discussion groups, resilience workshops, and educational programs, help break isolation and restore confidence and well-being. This also involves acknowledging suffering and creating spaces where everyone can express their fears and hopes. After a nuclear accident local projects such as community gardens on contaminated land, training programs for decontamination, and cultural projects such as exhibitions help residents of affected territories to transform the traumatic experience into a collective narrative as it was demonstrated in the CORE Programme in Belarus (Lochard et al., 2026). These actions demonstrate that reconstruction is possible, even if it takes time. They also remind us that well-being is not limited to radiological protection but includes rebuilding the social fabric and the quality of life.

Engaging local projects in the co-expertise process, whether individual or collective are a source of motivation and fulfillment for those involved. They not only strengthen self-confidence, but also the well-being of residents and the quality of living conditions of affected communities. Embarking on local projects can become an essential pillar of recovery, offering motivating objectives to the residents. Ultimately, post-accident projects are not only a way to regain autonomy of residents and improve the living conditions in the affected territories but also a way to overcome the loss of bearings where people live, and thus become more resilient and aware of one's own strengths.

## 2.4. *A key feature for ensuring vigilance and sustainability*

Cooperation between local residents, associations, scientists, and public authorities is essential for designing appropriate and transparent projects. Experts contribute their technical know-how, while locals contribute their day-to-day and intimate knowledge of the territory and of their needs and expectations. This cooperation is important to avoid imposed decisions from outside, which are a source of mistrust and sometimes of anxiety. Examples from Chornobyl and Fukushima clearly demonstrate that the involvement of all stakeholders fosters more sustainable and widely accepted solutions.

After a nuclear accident, cooperation is not an option but a necessity. It allows for the sharing of responsibilities, the pooling of resources, and the restoration of living conditions through working together. Affected communities have not only to overcome the immediate consequences of the accident but also to build a more resilient and united future. Past experience has shown that trying to return to the pre-accident situation is a dead end. It has also shown that the support of professionals, experts, and authorities is absolutely necessary to move local projects forward and thus improve well-being.

The management of the recovery process must be linked to the "long-term vision of the territory" taking into account the health, social, environmental, economic, cultural, memorial dimensions, etc. As mentioned above, the objective is to restore individual well-being and the quality of community life in the affected areas where people are allowed to reside. This implies the development of a sustainable socio-economic framework articulating the redeployment of infrastructures and socio-economic activities including innovative projects, the support of local projects initiated by individuals and local communities, and the dissemination and transmission of the experience gained in managing the situation. In this perspective, cooperation between the residents and local, regional and national authorities aims to develop and adopt a common project endorsed by the local communities to ensure their future including the different facets of sustainable development (WCED, 1987; Hammer and Pivo, 2017). In practice, such a common project relies notably on the selection of areas in which to re-establish social life and economic activities and the organization of the relevant support for their implementation, ensuring that they are mainly driven by local communities.

Resilience is generally defined in the literature as the return to an "equilibrium" after an event (Norris et al., 2008; Paton, 2009). However, the experience of the Chornobyl and Fukushima post-accidental situations reveals that a return to the previous situation is generally not achievable. Complete removal of radioactivity from contaminated areas is not feasible and whatever efforts are made, there is always residual contamination, especially in forest areas (Takada et al., 2020). In addition, many human and societal consequences are irreversible and the destabilization of communities leads to disruption and complex dilemmas. To cope with this situation as Norris points out in his article, resilience has to be seen as a "process" rather than a "result" and has to refer to "adaptability" rather than "stability". From this perspective, community resilience after a disturbance is described as: "a process linking a set of networked adaptive capacities to a positive trajectory of functioning and adaptation in constituent populations" whose final results aim at the well-being of individuals and communities (Norris et al., 2008). Favoring and supporting the emergence of local projects within the co-expertise process are essential to reconnect the people to a dynamic of socio-economic development while ensuring the protection of people and the environment against radiation.

As the cohesion of the local/regional communities has been significantly affected by the consequences of the accident, it is necessary for the local communities to elaborate and promote a common project to support the socioeconomic development in a harmonized and fair dynamic. In this context, as Norris

emphasizes, the main objectives of the community resilience process are to reduce risks and resource inequities, involve the local people in mitigating the consequences, create organizational links between all actors, as well as stimulate and maintain social support. Such a process requires relying on reliable sources of information but also on flexible decision-making skills with the participation of the affected citizens (Norris et al., 2008; ICRP, 2021).

## Conclusion

Community resilience in affected areas requires the deployment of a socio-economic programme with governance mechanisms that respect ethical values. This approach will ensure that people and the environment are protected against the risks of ionizing radiation and will contribute to decent living and working conditions to communities affected by a nuclear accident. It is of primary importance to rely on the involvement of local communities in the elaboration and deployment of the socio-economic activities with due considerations for ensuring the integrity of the communities, and respecting their choices.

From a radiological protection point of view, the primary objective of the framework for recovery is to contribute to protecting people and the environment and to ensure the "well-being"/"wellness" of affected individuals (Oughton, 2016). Therefore, it is essential to ensure that the local projects are clearly articulated with these objectives and not only driven by economic considerations. The decision-making process put in place for promoting and selecting these local projects should take due considerations of the impacts and contributions that decisions may have on living and working conditions, life expectancy, mental health and well-being and livelihoods of the affected people. Environmental protection and more globally the quality of the environment have also to be considered in this process. In addition, the adoption of local projects should necessarily be accompanied by measures dedicated to the organization of vigilance on health and environmental issues.

The deployment of local projects contributing to the socio-economic development should aim at ensuring equitable and fair contribution to the protection and well-being of the different affected communities, and the different categories of stakeholders. In this perspective, it is essential to put in place governance mechanisms including representatives of the different stakeholders at local/regional and national levels in order to identify the main priorities to achieve this goal. In addition, during the implementation of the socio-economic programme, it is necessary to regularly evaluate whether its implementation ensures a good and fair balance in the allocation of human and financial resources and to identify whether additional efforts should be granted for certain local communities. In practice, individuals and local communities are affected differently by the residual contamination, their exposures depending on their habits, their environment and their socio-economic situation. Furthermore, the benefits and drawbacks of implementing protective actions are not always distributed evenly among the people concerned. In this context, special attention should be paid to the protection of vulnerable groups and future generations.

The post-accident situations of Chornobyl and Fukushima emphasized the imperative need to restore and preserve the dignity of the residents and communities affected by the accident in the recovery process. In this perspective, the establishment of a socio-economic programme should first be based on the voluntary commitment of residents and communities to live and/ or work in the affected areas. Therefore, for the implementation of local projects, it is necessary to ensure that resources (human, technical, financial...) are available to preserve the autonomy of residents and local communities (Thu Zar, 2022). The socio-economic programme should therefore include specific measures to support citizens' initiatives aimed at regaining control on their daily life, where experts, through the co-expertise process, are at the service of the residents and communities. This requires the support of the authorities and the respect of individual autonomy.

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